

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Boston, Mass., and additional mailing offices

© 1974 by Computerworld, Inc.

ISSUE DATE

July 3, 1974

Vol. VIII, No. 27

NEWSPAPER

at
DPMA

Federal-Only Data Law Seen

By Edward J. Brinde

OF THE CW STAFF

MINNEAPOLIS—Despite the Federal Government's ability to control information practices in the private sector, only government data banks are likely to be included in any laws passed in the near future.

The reason such bills as those proposed by Sen. Sam Ervin (D-N.C.) may not reach the private sector is the lack of confidence in the remedies provided for victims of violations of individual rights, according to Philip W. Buchen, the man



On Photo by Edward J. Brinde

Twins Lua and Lora Bennett, 10, of Louisville, Ky., try out IBM data entry system demonstrated at DPMA's Info Expo by Univar's Winnie Long. Other DPMA coverage is on Pages 6 and 7.

chosen by Vice President Gerald Ford to head the Domestic Council Committee on the Right of Privacy.

Believing the keynote address at the 22nd annual conference of the Data Processing Management Association (DPMA) here last week, Buchen suggested that because of the interstate nature of big business, "almost everyone" could come under federal privacy legislation.

But the "sentiment in Congress" today is "to proceed slowly" so Congress can get experience at its own level, before passing laws involving the private sector, he suggested.

This is despite pressure from such organizations as the American Civil Liberties Union to make laws more broad, he added.

Buchen also told a press gathering that a Data Inspection Board such as the one operating in Sweden could not possibly be effective in a country the size of the U.S.

(Continued on Page 4)

New York Forced Out of CCH System For Failure to Update 'Rap Sheet' Files

By Nancy French
and E. Drake Landell Jr.
OF THE CW STAFF

WASHINGTON, D.C.—New York State has been thrown out of the FBI's Computerized Criminal History (CCH) system after a protracted dispute over updating criminal history information.

Almost simultaneously, another large state—Pennsylvania—withdrawal from the system claiming it was too expensive in terms of staff and other resources.

The New York case is the first instance in which a state has been forced out of the system because of a failure to update "rap sheet" information held in the CCH

files, sources indicated.

The removal of New York and Pennsylvania's withdrawal leave only four states participating in the CCH system—Arizona, California, Florida and Illinois—even though a host of other states is currently applying to the Law Enforcement Assistance Administration (LEAA) for funds to enable them to join CCH.

'Competing Priorities'

New York "withdrawal" from the system because "competing priorities" made the state unable to update the records placed in the file so far, according to Archibald Murray, head of the state's Division of

Criminal Justice Services.

Since the merger of the New York State Identification and Intelligence System (NYSIS) into the state's new and larger Criminal Justice Services Division, "we've had to focus on delivering the best possible service within our own systems first," Murray said.

This required reorganization, new staffing and changes in the agency's workload, he said, adding "the voluntary participation in CCH had to take a lower priority. 'There came a time when we indicated to the FBI that we would not be updating our file, and they felt it would be an 'awkward' way to run their system, so our only choice was to withdraw," he said.

However, Justice Department sources indicated New York tried to convince the FBI to let them stay on the system without updating the records and this was rejected by the bureau.

These sources noted the Advisory Policy Board for the National Crime Information Center (NCIC), which contains the CCH files, has established a requirement that all states tied into the system update their records regularly.

The New York "withdrawal" came only after the Advisory Policy Board voted to remove the state from the system for its failure to update its records.

At the same time, Dennis Lofgren, an NCIC staff member, reported earlier that many of New York's updating problems have resulted from the state's use of low-speed telephone lines to transmit update information to the NCIC in Washington and these lines could not accommodate the high volume generated by the system.

At the time of its withdrawal from the system, New York accounted for almost 45,500 or 10% of the approximately

(Continued on Page 2)

plied by Collins Radio, and other customer-provided equipment. However, C.M. Huntley, telecommunications director at Continental, said he had no information about any Bell reprisals against his firm.

James W. Masick, president of Truckwell Industries Co., Seattle, told the subcommittee that Pacific Northwest Bell had reduced orders to his firm after he had installed noncarrier telephone equipment.

Hearings before the subcommittee chaired by Philip A. Hart (D-Mich.) are scheduled to continue this week.

CIA Seeks Files

Meanwhile, the Computer Industry Association told the Federal Commu-

(Continued on Page 2)

Separate Centers Funded Committee Slashes Teale Budget

By Molly Opton

OF THE CW STAFF

SACRAMENTO, Calif.—The Budget Conference Committee of the California Legislature struck a blow to the concept of DP consolidation last week by cutting in half the budget for the Stephen P. Teale Data Center and allowing two departments to continue operating separate DP centers.

The recommendations of the committee were expected to be ratified last week by the legislature, sources said, as the new 'fiscal year began July 1.

The Department of Motor Vehicles (DMV) was allocated about \$6.5 million for DP work, allowing it to seek a solution independent of the Teale center. Under the original budget, DMV was to receive \$4.5 million with which to purchase services from the Teale center.

Conversion of the DMV records to IBM equipment in the Teale center was not accomplished by IBM by July 1, the deadline date specified in the state's contract.

The firm had acknowledged slippages and in May was quoting \$4.5 as a probable date of completion.

However, the date currently being discussed is Oct. 11, which is generally considered to be too late to allow the DMV to switch to a staggered vehicle registration this year, sources said.

The plan for staggered registration, and IBM's word that it could meet the July 1 deadline, were among the principal reasons for awarding the contract to IBM, state legislative sources indicated.

In addition, the Department of Water Resources (DWR) will continue to op-

(Continued on Page 2)

On the Inside This Week

'Unisys' Discounts Differences Among Minis — Page 13

Race Is On in Flexible Disk Drive Area — Page 24

Communications — 17

Computer Industry — 24

Editorial — 10

Financial — 18

Professional Practices — 12

Software/Services — 13

Systems/Peripherals — 19

Announcing an ideal computer marriage: The Sperry Univac 90/30.



High performance and moderate cost are not often compatible. But in the case of the 90/30, the newest member of the SPERRY UNIVAC™ Series 90 computer family, they're the perfect match.

High performance. Start with the OS/3 operating system, designed specifically for the 90/30 system. It's an advanced disc-resident system that meets the total computing and operating requirements of today's advanced data processing environment. With OS/3 your data can be processed in either sequential, indexed sequential or random manner.

More high performance: The 90/30 provides you with multi-tasking benefits so that programs can be constructed as a series of individual tasks which can be executed asynchronously. In addition, multi-jobbing capabilities allow the system to run up to seven programs concurrently.

Then, for communications applications, the 90/30 provides for up to 12 full-duplex or 24 half-duplex communications lines. This means you can expand your information processing capability at a rate consistent with your needs.

Moderate cost. Not only is the new 90/30 system reasonably priced, but your investment is protected, too. Your upward move is economical. No competitive system has the growth potential of the 90/30. In short, the price/performance ratio of the SPERRY UNIVAC 90/30 makes it a system in a class by itself. How many computer marriages can you say that about?

To find out all the reasons why the new SPERRY UNIVAC 90/30 computer system makes performance and cost so compatible, just talk to your Sperry Univac representative. Or write Sperry Univac World Headquarters, P.O. Box 500, Blue Bell, Pa. 19422.

SPERRY UNIVAC
Only when our customers succeed do we succeed.

Senate Determined to Pass Privacy Bill This Year

By Nancy French
Of the CW Staff

WASHINGTON, D.C. — Although legislators who will bring the Senate floor bills to guarantee the individual's constitutional right of privacy have not agreed on the feasibility of including commercial as well as government data banks under the proposed law, they seem determined to get some kind of a bill on the President's desk this year.

Urging all testifying at an ad hoc Senate Subcommittee hearing on privacy legislation to speak their minds, Sen. Edmund A. Muskie (D-Me.) said, "The committee is not wedded to a single bill; we are interested in compromise to get the best possible bill passed this year."

Testimony was heard from all sides of the data privacy issue, including former Attorney General Elliot Richardson, Hope Eastman, representing the American Civil Liberties Union; Alan F. Westin, professor of public law and government, Columbia University; Philip W. Buchen, executive director, Domestic Council Committee on the Right of Privacy; Vincent P. Barabba, director of the Bureau of the Census; Richard M. Schmidt Jr., general counsel, American Society of Newspaper Editors, and many other representatives of state governments and computer users.

Richardson, who as Secretary of Health, Education and Welfare established the HEW Advisory Committee on Automated Personal Data Systems, said it is now time to consider whether records should be kept on individuals — governments could not function without such records. "The objective of a policy to protect personal privacy as it relates to information management should... assure that [the individual] can participate in determining how he will be affected by the creation and use of records."

Richardson said he supported legislation that would apply only to federal agencies and state and local governments whose

information management functions served federal programs.

"When the Congress finds 'prima facie' evidence of abuses" on the part of private industry, only then should "Congress" take action toward developing additional legislation," he said.

Circle of Freedom Threatened

On the other hand, Eastman said, "our Constitution guarantees to each of us a circle of freedom into which the government may not venture. Yet the increasing tendency of government and private institutions to collect and disseminate data on individuals threatens our ability to preserve that circle of freedom."

"We strongly support legislation which will require that a system's impact on privacy... be assessed and submitted to the Privacy Board before any organization launches a new information system or expands an existing one."

Such a statement "should include consideration of the reason for the program; of the potential harms to or invasions of the privacy of individuals; of controls on access, transfer, confidentiality and accuracy; of those problems which cannot be avoided; and of alternatives," she said.

Westin made three major points to the committee:

First, that 1974-75 is precisely the right moment for Congress to develop and enact such legislation because henceforth 1972 or '73 even "experts" were ill-informed about how computers were being used, what problems they posed and what kinds of regulatory responses were appropriate to the realities of the situation.

Second, any delay beyond 1974-75 could be extremely dangerous because it would assure that a large number of major data systems will be built that will make it extremely costly to alter the software, change the file structures or reorganize the data flows to respond to national standards.

Davis Warns of 'Technicalities'

WASHINGTON, D.C. — Although computer manufacturers were not directly represented at the Senate subcommittee hearings on privacy legislation, Ruth Davis appeared to present their views.

Davis, director of the Institute for Computer Sciences and Technology, National Bureau of Standards, dealt with the costs and feasibility of actually implementing legislation advocated by privacy proponents.

Davis cautioned that "it is an empty exercise to pass legislation that is technologically impossible to implement. Similarly, it is just a technological tour-de-force to design equipment or procedures that are too costly to use," she said.

"Until recently, the computer industry had devoted a relatively low level of effort to the problems of privacy, data confidentiality and computer security... because there was little demand for computer security outside of specialized applications in the defense and intelligence communities," Davis said.

"In the past year, computer manufacturers have begun to look quite seriously at privacy and computer security," she said, citing the \$40 million IBM Security Study.

Explaining to the committee the difficulties and expenses involved with safeguards such as restricting access to

a system, voice prints, signature readers, hand memory and fingerprinting, Davis said, "We cannot be certain they are technologically feasible or can be operationally effective at an acceptable cost."

With respect to controlling access, "the technical problem begins to escalate if you wish to apply confidentiality tags within a file as for example, to a person's age, but not his job qualifications, or to data which is less than six months old but not if it's older, or to data which has always been accessed only if certain prescribed conditions are met."

With regard to building a record of all persons who have access to a file, the second principal legislative requirement, Davis said, the question of technical feasibility rests heavily upon a number of factors:

- How many persons will exercise the right to see the record of access and how frequently?
- How detailed must the record be? Would it be sufficient to simply record access to the file containing the individual's record, or must there be a record of what specific data in the record was accessed?
- How quickly is the system manager expected to respond to a request to seek the record of access — immediately, two days, three weeks?

Speaking for Vice President Gerald Ford, Buchen urged that legislation be confined "to information practices of the Federal Government rather than reaching out once into the government operations or into private business... Then after experience is gained, further legislation can be passed to expand effective application of the record to the private sector and other information systems and, if necessary, to one outside the Federal Government."

Buchen emphasized the need to "distinguish between statistical and administrative records systems." Though both may contain similar information, administrative records are intended to be used individually directly, whereas statistical records do not affect individual privacy when used solely for the compilation and analysis of aggregate data.

Barabba recommended for inclusion in a bill an exemption for records collected and used solely for statistical purposes or as authorized by the U.S. Code.

The right of the individual to correct his own file, a key point in all proposed legislation, would bring "endless interruption and hopeless litigation to the production and dissemination of statistics, with very serious results as to the timeliness of data," Barabba said.

Richard Schmidt, who spoke on behalf of the American Society of Newspaper Editors, urged legislators not to allow the language of a privacy bill "to limit press access with a criterion for release considered to be public information on file with the government."

Schmidt cited a privacy law enacted recently in Hawaii, which provides that "all law enforcement records relating to the questioning, apprehension, detention, arrest or charging of persons for or in connection with a criminal offense against whom no conviction is secured, shall be deemed confidential and shall not be disclosed."

The subcommittee also heard testimony from state officials, the National Legislative Conference, a health data expert and the League of Women Voters. Representing the legislative conference, Ohio state senator Stanley Aronoff accused retail interests of sabotaging a privacy bill from the "fervent lobbying."

Correction

The basic small business rate of \$93/30 will cost about \$3,750/mo or \$143,760 purchase (CW, June 26).

Buchen Predicts Government-Only Data Bank Law

(Continued from Page 1)

Instead, he echoed the Vice President's recommendation that all new information systems should be preceded by a privacy impact statement; because of the short life of many data banks, according to Buchen, nearly 80% of all data banks could have had such a preposition within five or six years.

"Management Uncertainty"

The keynoter also observed the many different hills in state and federal committees are probably bringing "some threats or uncertainties" about what tomorrow may bring to your management of data systems."

And the privacy problem is compounded by computers and computers have placed the "face to face" environment surrounding dealings between people, he added.

"Repeated or observed personal circumstances and attributes of character, ability, beliefs or behavior inevitably influence how people regard and treat one another."

"But it was easier to cope with such influences and to overcome wrong impressions or frustrating consequences when person-to-person appraisals were the usual basis of transactions between people," he added.

As the social group became "too large for mutual contacts and appraisals," as communications went from word-of-mouth to written statements, and from written statements to automated coding, storage and dissemination, retrieval and use, "man lost control over

what was known about him and over who knew it."

Reporting on his group's work, Buchen said the full committee — which includes six cabinet members and heads of four

And, he added, those subjects treated at first will touch on "only a few aspects" of the right of privacy.

The committee will deal with other issues as soon as possible, he promised, noting he intends to secure the assistance of other interested groups such as the AFIPS privacy committee headed by Dr. Willis Ware.

Over 140 bills have been introduced in Washington, plus 45 in various states, dealing with privacy, he said. While only a relatively small number will become law, he predicted those which fall "may very well signal what you as managers of information systems can expect in future years," if the privacy problems addressed by these bills are not otherwise overcome.

And despite the likelihood that only government systems will be directly impacted by legislation at first, these laws "may set patterns for the eventual treatment by law of information systems in the private sector."

Buchen recommended DP managers should become aware of the demands that could be made by legislation.

Management's "enthusiastic acceptance" of technology and the delight and profit gained by technological changes "must not blind you to how other people in vast numbers feel about what has happened," he warned.

The point is not to revert to "primitive means for the processing and communication of all personal information... but to primitive virtues which would call for more and more serious serving each other's interests in privacy."

Circle Photo by Edward A. Biele
Philip W. Buchen



INDEPENDENT DISC CONTROLLER FOR LARGE COMPUTER SYSTEMS

The new large-computer configurations of the Memorex 3670 Disc Storage System go beyond mere 3830/3330 plug compatibility. You get extra configuration



flexibility as well as the extra performance and economy that are traditional in Memorex disc systems.

Like IBM, we provide string-switchable, direct access to as many as 3,200 million bytes on up to 16 single-density

or double-density drives. And to control them, Memorex has something equally as versatile.

We developed two control subsystems—the new Memorex 3672 Storage Control Unit and the 3673 Disc Controller. The 3672, which contains a writable control store, runs up to two 3673 controllers. And each 3673 runs up to eight single-density and/or double-density drives.

Then each 3672 control unit connects to as many as four Model 135 and larger System/370 processors and to block multiplexer channels of large System/360 processors. Furthermore, you can switch the 3673 strings to a 370/135 IFA in addition to switching them among larger processors.

In fact, a 3673-controlled string may be connected directly to a Model 125 DDA or a Model 135 IFA, when you upgrade from IBM 2311, 2314, 3340, 3333/3330 or 3830/3330 systems on small computers.

The writable control store gives fur-

ther leeway for individual system needs and future enhancements. All significant features of current 3330 systems, from rotational position sensing to write format release, are already in, naturally.

For extra throughput, the 3670 offers faster average access times and the same fast transfer rate. For extra availability, it has the industry's most advanced drive designs and diagnostic software.

The choice of Memorex for your large computer disc storage system will be totally supported because Memorex leases, installs and maintains more drives with a higher standard of performance than any independent system manufacturer in the world.

Memorex Corporation, San Tomas at Central Expressway, Santa Clara, California 95052, and all major cities.

MEMOREX

Emphasis in DP Now on Human Resources Utilization

By Tom Wiseman
of the CW staff

MINNEAPOLIS—The emphasis in data processing today is on the effective utilization of human resources and how it affects company operations as systems are implemented, according to Ken McReave, a consultant, with Peat, Marwick and Partners, Toronto.

The first step in recruitment is to define your needs, he told DPMA's Info/Expo attendees last week, and establish the technical requirements, such as job and company objectives, skills, experience and education, as well as behavioral characteristics, such as personality traits and interpersonal relationships.

Policy matters, including job classification, salary range, fringe benefits and manpower plans, as well as urgency/timing and selection criteria, should also be considered.

Internal manpower is the optimum source of candidates to fill a vacancy, McReave said, followed by word-of-

mouth information and knowledge of people in the industry.

Advertising and outside agencies trail the list of potential sources, McReave said, with executive search firms to be considered "only as a last resort."

Progressive Refinement

Once the job definition is completed the screening process begins. This should be viewed as a progressive refinement of the list of candidates, he stated.

Screening consists of four "levels"—the initial screening which is a resume review and interview; the second level where technical reviews, tests and reference checking take place; and the third level which consists of multiple meetings with various members of the organization, including a representative of the user department.

The final step is a new psychological tool known as the assessment center approach, McReave stated, consisting of group leadership discussions, management

exercises and psychological games.

The important step at the end of each "level," he emphasized, is appraisal and feedback.

DPMA Says Yes to Aflips

MINNEAPOLIS—As expected, the International Board of Directors of the Data Processing Management Association (DPMA) last week voted to back the DPMA application for membership in the American Federation of Information Processing Societies (Aflips).

The board's action came at the organization's annual conference, which attracted around 1,800 attendees and 30-odd exhibiting companies here last week.

The Aflips board has already had one favorable vote on the DPMA application and will vote for a second time this November at a meeting in San Diego, Calif. It is expected that the application will be approved then.

feedback which is, in essence, a candidate's ticket to the next level.

In reference to tests, McReave noted that according to an independent study 91 companies had employed some kind of intelligence test and 458 used either the IBM PAT or NCR E51 aptitude tests, while less than 10 firms used either personality or interest tests.

Serious pitfalls exist here, however, he cautioned, listing degree of validity (influenced by the similarity of the candidate's characteristics to those of the group involved in developing specifications), the administration of the tests, the familiarity of individuals to testing and the legal ramifications, such as cultural or racial bias.

The final selection should be based on the predetermined criteria for selection, appraisals of face-to-face interviews, the correlation of appraisals to criteria and finally a decision by the selection board and management, McReave said.

"It is interesting," he noted, "that the items supervisors rated as most important in appraising a candidate for a job were due to least important in measuring his performance once he had been on the job for a while."

Once a candidate has been selected, management's job is to keep him, McReave said, to keep him motivated to work.

After the worker has achieved some level of satisfaction, he said, the motivating action becomes important. Factors here include achievement, recognition, personal growth, advancement and increasing responsibilities.

Work simplification, meaningless work or increased quantity of output are non-motivating, McReave said, and will only thwart management's objectives.

"The objective of selection and control is to blend individual and company goals to benefit both," he concluded.

On-Line S&L Money-Handling Network Possible

By a CW Staff Writer

MINNEAPOLIS—It would not be unexpected in the foreseeable future for all savings and loan associations (S&Ls) to band together and set up an on-line money-handling network of their own, Don Barney, vice-president and manager, Information Systems Division, Glendale Federal Savings and Loan Association, told a session on point-of-sale (POS) systems at a DPMA session here.

Such a system would probably consist of some 200 automatic teller terminals which anyone could use, he added.

There are over 5,000 S&L's, and they are heavily regulated. They all offer the same product for the same price, so the question becomes one of better customer

service, Barney said.

Barney predicted a strong trend toward automatic tellers and shared facilities, as well as a nationwide asset and credit system similar to Bankamerica.

Barney referred to two recent POS experiments. The first is the Hinky Dinky/First Savings and Loan of Nebraska cashes all checks within the confines of the store at terminals run by bank people instead of store personnel.

Smitty's, has eliminated 80 man-hours a week spent on check-cashing operations and reduced bad check losses to nil since all losses are carried by Western.

Western, on the other hand, has opened what amounts to a new facility for the low cost of \$35,000 which includes modems and terminal, Barney noted.

Another operation, which is still running, is the cooperative venture between Western Savings and Loan and Smitty's in the Phoenix area.

The difference here, Barney noted, is that Western filed for branch applications, and the agreement is that Western cashes all checks within the confines of the store at terminals run by bank people instead of store personnel.

Smitty's, has eliminated 80 man-hours a week spent on check-cashing operations and reduced bad check losses to nil since all losses are carried by Western.

Why can't we sell computers in Japan?

In Japanese it's called Shukan Computer, and in English, it means "Computer Weekly." Whatever you call it, Computerworld's new sister publication is an excellent vehicle for selling EDP products and services in the large and expanding Japanese EDP market. Here are some of the reasons why:

- **Shukan Computer** is a joint venture of Computerworld and Dempa Publications, the leading Japanese publisher of electronics information services. With the combined resources of the two companies, Shukan has the largest news gathering organization of its kind in the world.
- **Shukan Computer** is the only newsworthy for the fast growing Japanese computer community.
- Initial circulation is guaranteed at 35,000, divided about 80% to end users and 20% to the computer industry. Circulation development methods currently under way are the same as those which gave Computerworld the highest paid circulation in its field in less than four years.
- **Shukan** lets you in on the action in the world's fastest growing EDP market. The Japanese Ministry of International Trade and Industry (MITI) has made the following 1976 forecast: 39,000 general purpose systems installed, up from 11,237 in 1971. 11,000 microcomputer installed, up from 1,070 in 1971, and 3,000 industrial systems installed, up from 1,066 in 1971.
- **Is this growth likely?** The latest census of general purpose systems revealed that there were 14,936 systems installed in September 1972, a one year gain of 3,569 units and \$11.1 million installed value, a growth of 31.7% and 23.1% respectively. And more than 50% of these new systems were American made.
- **It is true that there are import restrictions.** But Japanese vendors and users can get permission to import almost anything they want and need. As a result, 1972 imports were over \$365 million.
- **Advertising in Shukan is easy.** With Computerworld's representatives across the U.S. to assist you, it's easy to place space in Shukan. For a sample, we can translate and type set your ad from English to Japanese. To get more facts, just send in the coupon



To: Neal Wilder, Vice President
COMPUTERWORLD
797 Washington Street
Newton, Massachusetts 02160

Please send me more information on Shukan Computer advertising.

Name
Title
Company
Address

Zip



COMPUTERWORLD

Small System Success Depends On Right 'Who Runs It' Choice

By Nancy French
Of the CW staff

MINNEAPOLIS — A key to getting your money's worth out of a small- to medium-size data processing operation is assessing correctly whether to "let somebody else do it" or whether to "do it yourself," according to four speakers at a DPMA session here.

"Knowing thyself" and understanding one's needs is the first step toward making the choice, said William R. McArthur, MIS manager for MTS Systems Corp. here. The user must be aware that the key to success is "managing change, not technology," he added.

CW at DPMA

If "you can justify hiring data processing expertise, if you anticipate growth, if you want to develop and manage a data base and prefer to control your own resources, thereby minimizing costs, then you really should 'do it yourself,'" McArthur observed.

On the other hand, commented Bruce Banister, a consultant specializing in small business systems, if "your company exhibits a limited knowledge and interest in data processing, equipment selection and answers to problems; if you cannot justify the necessary staff to start up and operate an in-house system; or if it's urgent for you to get a system up right away, yours is a job for a consultant or facilities management team."

Obstacles, Rules

On the "do it yourself side," both McArthur and Patrick M. Finley, treasurer at Contech, Inc., described the pitfalls they

encountered and guidelines they established setting up in-house operations.

"In a small shop you'll need a few people who can serve in multiple functions," McArthur said, adding it is advantageous to give the computer programmer/systems analyst a chance for greater challenges and real "hands on" experience he wouldn't get in a large installation.

"Pay them well, challenge them and keep them," he said. "To assure project control, take small 'bite size' steps — avoid large schemes," he warned.

Finley echoed McArthur's views in describing the experiences of his company. After six months of operating with one keypunch machine and an operator, and farming DP functions out to three different service bureaus, the firm decided it needed to consolidate the DP effort.

It needed to continue accounts receivable, sales analysis and inventory control without interruption, he said. Early on it was decided to continue with payroll out-of-house.

Faced with a choice between IBM and Honeywell, "we chose the Honeywell 58 system because IBM promised to do everything for us. Honeywell wanted our people involved and would not sell the system without getting a commitment from Contech to do its own programming."

The company decided it wanted that capability in-house, so it went to Honeywell. "Our biggest problem was with our electrician," he said. "When we brought in the computer we found we had Delta service, and the computer needed a Y-type system. So for three weeks we had the computer sitting there idle," he said. John Knauff of Rosemount, Inc., a Min-



Bruce Banister

neapolis-based "resources management" firm, urged attendees to consider the "let somebody else do it" approach in managing a business.

Defining resources management as a concept which utilizes facilities management as a tool, the director of material and systems explained "that only a firm providing a complete range of services and systems capabilities should be called a resource management firm. This does not include turnkey software houses or



Patrick Finley

service bureaus by definition, Knauff claimed.

Before going to this concept, he urged attendees to know "why" they are taking that approach to the management of their businesses.

Once the firm has assured a high level of management skill in systematic thought, committed the financial resources, is willing to commit the people and equipment resources, the chief executive officer should determine the firm's readiness.

Management Isolation Has Cure

MINNEAPOLIS — "A credibility gap, born of cost overruns and unfulfilled expectations, has separated data processing from top management today," John Soden, a McKinsey and Co. consultant, told DP managers here.

"Top management has abdicated responsibility for the information processing function because they can't understand it, and can't relate to it," Soden stated at a DPMA session.

"If your boss is 'leaving you alone' you're not doing your job, according to Soden, because he isn't getting the input he needs to make management decisions

about the DP function in the company.

Soden suggested remedies for this management malady:

- "Establish communication with key people in your company. A lunch list is a good method.
- "Develop a broader understanding of your organization, and make your boss' problems your problems.
- "Submit regular progress reports — at least monthly — so your manager knows what you're doing.
- "Use new-found insight into your company's problems in planning your department's long-range objectives."

CIS eases NEW 370 today!

That's right -
today!
Literally!

CIS SELLS AND LEASES

CIS has an extensive inventory and on-order position with IBM which enables us to ship a 145, 158 or 168 to you when you need it by IBM serial number and factory order number. 158's are in inventory now and can be shipped immediately any month throughout 1974 and 1975. The next open delivery dates for 145's and 168's begin in June and July respectively and continue until mid-1975. Specifications are available upon request and can usually be altered to meet the user's needs prior to delivery. CIS also has two used 158's available, one in August and the other in December, 1974.

Other systems ready for immediate shipment are 370/15's and 360/50's. 50's, 40's and 30's A 370/15's are scheduled for mid-summer 1974. Various peripherals are also available. Again, all specifications can be adjusted.

We offer several leasing plans, both long and short term, so that doing business with CIS permits you to meet your financial planning needs — as well as your data processing needs in the most advantageous manner. Applicable Investment Tax Credits may be passed through CIS to the customer or, in the event of a lease, retained by CIS in accordance with the lessee's wishes. If you have a book-value problem with your present system, CIS can help you solve it by accepting a trade of the system against the purchase or lease of replacement equipment.

CIS BUYS

CIS will pay fair market value in cash today for your installed equipment. While our primary needs are for additional 145's, 158's and 165's, we have a continuing interest in all 7000 series and 360 systems and peripherals. We will buy your equipment for delivery to us immediately or for delivery at a future date. If for future delivery we can buy it now and lease it back to you until your replacement system is installed. This program removes all financial uncertainties associated with a major equipment change and allows you to plan your financial needs at a much earlier date.

NEW.

Cancelling or deferring an on-order 370? It may be profitable for you to discuss your plan with CIS as we can exchange scheduled delivery dates with you — or purchase your date for use in our sales or leasing programs. Exchanging dates offers planning advantages to you that may not be available from the manufacturer. When planning a 370 equipment decision if pays to discuss your plans with experienced 370 people at CIS — We have a proven record of providing unique opportunities to data processing and financial managers.

Unusual? Yes, but we've already done it for over 50 major users in the United States and Europe.

- Sales, or Lease, or Trade
- Investments Tax Credit
- IBM Maintenance and Warranty

CALL COLLECT
315-474-5776

RICHARD AMPHELLE
OR FRED P. HOLLETT

GENERAL MANAGER
CIS EUROPE, SA
80 CHASSE DE CHARLEROI
1060 BRUXELLES
PHONE: (02) 38 80 83
TELEX 26025 BUR08 B

CONTINENTAL INFORMATION
SYSTEMS CORPORATION
MILWAUKEE, WIS.
1000 W. WISCONSIN
ST. WISCONSIN
PHONE: (414) 381-1000
TELEX 26025 BUR08 B

CIS
CONTINENTAL INFORMATION
SYSTEMS CORPORATION

Ground Transport Erratic

Still Not Fully Accepted

Airport System Has Trouble Getting Off the Ground

By Patrick Ward

Of the CW staff

FORT WORTH, Texas — Six months after opening for business, the "world's biggest airport" is still having teething troubles with its computer-controlled ground transportation system.

About 40 rubber-tired trains, dubbed the "Aitrans" system, are now circling 13 miles of track at the Dallas/Fort Worth Airport, shuttling passengers from parking lots to terminals and from one airline to another, but they have acquired an unsettling reputation for stopping suddenly in the middle of nowhere. And the computer-controlled audio system advising passengers the vehicle is pulling into a particular station has a tendency to do so when the station is still several stops away.

For these reasons, the system, which was developed by LTV Aerospace Corp. to run without human operators, still has not been formally accepted by the airport a year after the original target date.

The scheduling of surrounding airport construction had been "way off base," contended Austin Corbin, Aitrans program manager for LTV, and this interfered with Aitrans work.

"Of course, the system couldn't have been accepted at [the original target date] because the airport itself wasn't finished," he explained.

For a three-month stretch, LTV had technicians riding the vehicles both as a public relations gesture and to overcome some of the cars' "nervous reactions."

Technicians are still riding in the more sophisticated Aitrans cargo system that

carries baggage, mail and trash around the airport.

D.L. Leftwich, the airport's Aitrans control administrator, said the unexplained stops have gone down 50% since the airport's opening in January, but the software-controlled audio announcement system has been a major problem.

Corbin traced the problem to an "attempt to use commercially available eight-track tape transports which I guess aren't good enough for this application."

A third computer-controlled system displays an incoming vehicle's destination to passengers waiting in an Aitrans station. Both Corbin and Leftwich agreed this has worked well.

For the Aitrans system to be accepted by the airport, Leftwich observed, there must be at least 65 operational cars, but modifications to correct the system's problems are keeping down the number available for service.

In spite of the delays, said Leftwich, "we're making very good progress" in resolving the problems, which are "normal for a sophisticated system such as this."

Corbin said he hopes for full acceptance within three months.

Six Modular Computer Systems Modcomp 1 minicomputers control the Aitrans system. The cars have hardwired logic units which communicate through a signal rail by means of relay sensors in the tracks, Corbin explained.

Five 16K substation CPUs collect this data and communicate with a master system that now has 64K, rather than the 32K originally planned.

The unexplained stops came from the fact that there "are two main control systems affecting the vehicles," Corbin observed. There is a safety system that stops the car when it senses a problem and can't be overridden, and a movement

system that controls the running of the cars.

Not only software bugs but loose wire connections in control devices are enough to halt the vehicles, Corbin noted.

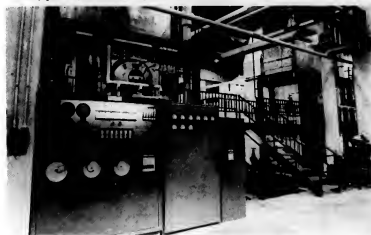
Computerization reaches into the giant airport's central utility plant, where a 32K Modcomp 3 minicomputer with a 1.2M-word moving head disk monitors data from over 900 sensors.

The system, backed up by another Modcomp mini, sounds alarms when variables in the huge heating and cooling systems pass set limits.

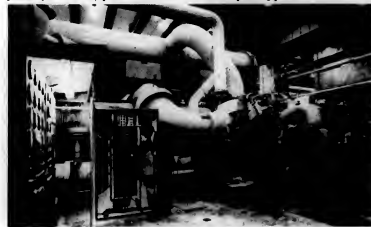


Photos by Alton Swell

Dual CRTs, one backing up the other, sit in the middle of the central control console. On each side are screens showing schematic diagram slides that provide quick reference to utility plant layout for less experienced staff.



Nine gauges mark the cover of a remote terminal unit that collects sensor data and is polled by the minicomputers. To the left is a boiler's operating panel.



The inner workings of a remote terminal unit stand revealed.



Aitrans car pulls into hotel station.

Beyond this, the automated system provides the utility plant's historical data storage and retrieval and does billing data collection.

The computer system also produces a daily summary of the plant's operations.

Supervisor of utilities A1 Utesch credits the computerized system with allowing a staff of only 10 workers to run the over \$17 million plant 24 hours a day, seven days a week.



Staffers at the Aitrans control station keep watch for "nervous" trains.



The world's largest airport, appropriately in Texas, runs on the computer-run Aitrans system to move people, baggage and cargo around the 27-square-mile airport. A computer system also monitors the \$17 million central utility plant that serves the airport.

**If you're last
on the routing list,
the solution is
right under your nose.**

order your own subscription

Please send me **COMPUTERWORLD** for 1 year RATES: U.S. - \$12 Canada - \$13 Other foreign - \$36

- ☐
- Check Enclosed

- ☐
- Charge My American Express Account:

If charge we must have cardholder's signature:

First Initial		Middle Initial		Surname																	
Your Title						July 3, 1974															
Company Name																					
Send to: Address																					
City										State		Zip Code									

Address shown is: ☐ Business ☐ Home ☐ Check here if you do not wish to receive promotional mail from Computerworld.

**COMPUTERWORLD**

CIRCULATION DEPT. 797 Washington Street, Newton, Mass. 02160

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

- 10 Manufacturer of Computer or DP Hardware/Peripherals
20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/ Other Communication Service
95 Other:

TITLE/OCCUPATION/FUNCTION

- 11 President/Owner/Partner/General Manager
12 VP/Administrative VP
13 Treasurer/Controller/Finance Officer
14 Director/Manager of Operation/Planning/
Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
89 Other:



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Editorial

Just So Many Empty Words

Can it be that increasing competitive pressures on the Bell System are leading the nation's largest common carrier to use ambiguous tariffs for its own benefit?

The question is a serious one and probably has no easy answer. And yet increasing incidents have occurred in which AT&T spokesmen have released answers to tariff questions which were completely reversed several days later.

Officially, AT&T explains these cases by saying those who gave out the original information may not have had all the facts. And it is understandable that in a large organization internal communications can pose a problem.

Nevertheless, a common carrier has every opportunity to hide behind a cloak of regulatory immunity—at least as far as interpretation of its tariffs are concerned. The entire relationship between the carrier and the Federal Communications Commission (FCC) leaves much to be desired. For it is the carrier that initiates the tariff, it is the carrier that then applies the tariff, and it is the carrier that interprets the intent of the tariff to the user.

The FCC comes to question the intent of a tariff only when a specific problem is brought to it or a proposal is unclear to its staff members. The former case happens infrequently.

Although many users do speak up, the majority of phone customers are ready to accept tariffs as they are interpreted by the carrier. Firms in competition with AT&T do question and probe the intent of tariffs but usually their motivations are geared to protecting the competitive relationship rather than looking out for the rights of the telephone customer.

The latter case is rare simply because the FCC staff, like any other government agency, can only devote a limited amount of time to make in-depth analyses of tariffs originated by AT&T.

It is against this background that AT&T has become increasingly fluid in interpreting its own tariff requirements. On several recent occasions, Bell has reversed itself in questions concerning its equipment or services, and in each case the reversal appeared to correct an apparent discrimination against the user of customer-provided equipment.

The latest example involves an AT&T statement that the user of a noncarrier 9,600 bit/sec modem must pay for service terminal installation when upgrading a Type 3002 line to include D1 conditioning. Originally an AT&T spokesman had said a user who upgraded to Bell's 200 modem with D1 would not pay for the \$100 service terminal installation, while the charge would apply to the independent modem user.

This story was then corrected to point out that all installations of D1 conditioning would have to pay the \$100. (See story page 17.)

Other cases where original data from AT&T has been updated with new information includes the Dataphone Digital Service, and the Bell 209 data set charges for multiplexing, and the interpretation of new rates.

The key question in all these cases is really not the intent of the Bell System and/or AT&T. It is instead the intent of the regulatory process.

If tariffs written by a regulated carrier are designed to apply equal services at equal rates to all subscribers, then there can be no room for ambiguity. What makes this situation so much worse is that the smaller user is (as is so often the case) at a disadvantage. The volume discounts available to large users are out of reach of the majority of small subscribers.

The large user is served by a Bell national account representative. He can call this representative and usually get clarification of a tariff question (or benefit) in short order. But a small user gets no such favorable treatment. Often he must interpret the tariff regulations for himself.

Even if we give the common carrier the benefit of the doubt and assume that many tariffs are unintentionally written in an unclear manner, there is no excuse for this situation to continue.

A carrier must not be allowed to take advantage of the regulatory process for its own gain. As long as this practice continues, the FCC order calling for full and fair competition between AT&T and noncarrier vendors will be just so many empty words.



Eyeball to Eyeball

Letters to the Editor

Cobol for Minis Would Be Boon To Distributor With Foresight

I endorse the theme of the editorial "Minicobol, Now!" [CW, June 19]. It seems ironic that such an alleged leader as DEC would (a) have to pick up Cobol from a foreign country, (b) seem reluctant to promote it among its users, and (c) fail to recognize that availability of Cobol would be an added stimulus to its marketing.

Since building Cobol compilers is my favorite for-pay endeavor, I should like to state unequivocally for the record that it is not difficult to fit a minicomputer with a good Cobol capability, with in 12K 16-bit words, in a time span of six months—provided the manufacturer contracts with people who have a proven record of accomplishment in the field of Cobol compiler development.

One question remains to be answered: How good is the Australian product?

Ken Seidel

Fallbrook, Calif.

Network Management Center Not Based on Modem Choice

Regarding the user casebook article on the Xerox Computer Center at Webster, N.Y., which appeared in the June 12 edition, I would like to clarify several points.

In discussing the network control center feature, I indicated the design of our data processing system required a methodology for trouble isolation and service restoration in a multivendor, multidisciplinary environment. The decision to include a network management center (technical control center) was a design decision which was not predicated on the choice of modem. The network management center was specified as a complement to the computer hardware and was not dependent on any predetermined modem choice.

Additionally, I indicated the choice of lines was a half-duplex 4-wire facility. We are paying half-duplex rates but we have full-duplex facilities.

Finally, I should point out that the opinions expressed in the article reflected my personal viewpoint only, and should not necessarily be read as those of Xerox.

Thomas H. Bowne

Webster, N.Y.

Honeywell as Moral as Grosch

As a private citizen, Herb Grosch had the right to express his views to James Binger of Honeywell. It was not appropriate, however, to publicize them in *Computerworld* as you did in the April 24 issue.

Further, his comment on the need, and value, of businesses to be moral as well as enterprising does not exactly come as a great revelation. The sugges-

tion that top managers are more motivated to be unethical than middle managers and technicians would be laughable were it not for the possibility that someone might believe him.

In making such statements not only does he display a genuine lack of understanding, he insults a large segment of CW's audience and unjustly does harm to one of the few companies making a meaningful contribution to the computer industry. I submit that Honeywell and its management are every bit as moral—and ethical—as Grosch and CW. But perhaps that depends on your definition of morality and ethics.

J.W. Cannon

Edmonds, Wash.

Let's Decode Spin Numbers

First, my belated congratulations on Herb Grosch's Honeywell column. All its points were well taken, particularly the fact that Honeywell is losing out on a lot of talent due to its unyielding corporate stance.

Second, I'd like to suggest that *Computerworld* explore further some facts revealed on the recent ABC special "The Paper Prison."

That special not only uncovered, but put an immediate end to, a Defense Department policy of classifying each honorable discharge with one of 500 distinctive Spin (acronym unknown) numbers. The point of the special was that the discharge wasn't told what his particular number stood for, though several of the nation's largest employers (including Honeywell) were.

Thus, more than half a million veterans were assigned codes—designed by computer programmers—which affected their lives without their knowing how and without any ability on their parts to do anything about it.

The Spin numbers stood for such subjective categories as "lazy," "below standard performance" and "lack of initiative"; columnist Herb Cuen noted one male veteran whose Spin number translated to "pregnant WAC."

I'd like to suggest that CW obtain a list of these Spin numbers (maybe from Honeywell) and re-present them as an example of how data processing procedures, people and principles can be abused.

James Bunker

Hayward, Calif.

Thanks to America's Defenders

I support the point of view expressed by G.F. Herndon in "What's Wrong With Aiding the Defense of America?" in the June 12 issue.

It is to CW's credit that the item was published in light of its apparent editorial policy.

Gary L. Hammon

Austin, Texas

The views expressed in the column Black Hat/White Hat are the personal opinions of Herb Grosch and do not represent the official editorial policies of *Computerworld*. E.d.

Letters to the Editor

Certification Unfair To Minority Groups

Again we find Alan Taylor's columns advocating certification programs for data processing professionals.

I think this concept should be challenged.

Our specialty has been one of the "fast tracks" for non-college educated people. Written testing usually creates a cultural bias against those of more limited education.

I have had the pleasure of working with many data processing "pros" who ended their formal education at the high school level.

Inevitably, a certification program requires a year-of experience credential and just as surely part or all of that requirement will be waived for those with appropriate college training.

This will slam the door for many persons in the job market. Blacks, women and those of limited education have created an enviable record in our field. Our rewards for ability alone have allowed us to enjoy the talents of many excluded by other disciplines.

Why certification? Usually the reason is to protect an unwary public from those with insufficient skill.

Our field is not in the marketplace affecting consumers. Businesses should be able to evaluate candidates without this crutch. Certification is a threat to many of our coworkers and po-

tentil coworkers. It is time for deemphasis of certification as a goal of our specialty.

Senior Financial Analyst
GAF Corp.
South Bound Brook, N.J.

Who Will Retrain Displaced Workers?

In regard to the editorial of June 12, "Storm Warnings," it has been said that management problems are now solved through systems analysis. Is it not possible to approach social problems in the same manner?

If a middle-aged worker wanted to learn a new skill, what avenues are open to him? Whose responsibility should it be to see that he doesn't become displaced in society? If his employer replaces him with a machine is his employer willing to help him find a new place in society? Should the Federal Government provide assistance to employers for such a program? Surely men and women are not useless in their middle years. Indeed, some feel that the middle years are the very prime of life. It should not be necessary for people to have to start all over again in their middle years. Surely by that time in their lives, they have attained some knowledge and skill just from living! There is an educational and economic gap. Surely a nation as technologically advanced as ours can find the solution to this problem.

S.A. Rummage
Systems Analyst
Ferris State College
Big Rapids, Mich.

I can't do it!

Can't hold the long-awaited meeting of the Polynesian Information Processing Society (Pips), that is. I've been looking forward to this through years of Europe, California and bureaucratic exile — looking to my second Tahitian visit and the second meeting of Pips.

I founded the society, and became the only voting member, back in 1960. Herb Robinson had just run me out of CEIR for telling him Stretch wouldn't fly, and I was en route to the first Australian computer meeting.

Problem is, the bylaws state that meetings shall be held "in Polynesia," and the Pips constitution defines Polynesia as "those islands of the Pacific between 40 degrees north and 40 degrees south latitude not having an IBM office."

And, shattering every yachtman's dream of an earthly paradise, there is an IBM office in Papeete, I have in my hand a certified copy of a letter which, translated from elegant French, says: "I the undersigned Hierve d'Hautville, technical-commercial engineer, attest the real and concrete existence of Agence IBM-France in Tahiti (Papeete)."

Turns out this is the "largest" IBM agency. Its base is in Noumea, New Caledonia, and its two branch offices ("Sous-Bureaux") are in Papeete, 4500 km distant, and Pnom Penh, 8000 km away. What a sales territory!

There are five 360/20 machines installed here, and three 370s on order. And of

course, many typewriters. The key customer is CEA, *Commissariat à l'Energie Atomique et du Centre d'Etudes du Pacifique*. Like the AEC in Vegas but much, much more out of place.

Anyhow, IBM has been here since 1968, this is not Pips country any more, and I must shamble off to Ottawa winging my Polynesian paddles. Next time I'll go to the outer islands — not just Bora Bora, for there is an ex-OJCK man there! — but to Raiatea or Huahine. Or better yet, Lan-Chile Airlines flies to Santiago here via Rapa Nui, Easter Island. That ought to be safe from computers (or a few years, unless Japanese tourists leave some hand-held jobs at the archeology sites).

It's still a lovely place, and away from the jet airport and the Papeete traffic and the Chevrolet salesman and their wives, still green and ocean-girl and peaceful. Nuclear tests and hotel accountants and the population explosion threaten it, but as long as there are sailors and lovers and dreamers, Tahiti will live on.



Herb Gross

Is There Unprofessionalism at the 'Highest Level'?

Manohar D. Apte of Oakland, Calif., sent me some computer output which he calls "the type of unprofessionalism that gives our industry a bad name." Especially, he said, when it is occurring "at the highest level" of our profession — the Institute for Certifying Computer Professionals (ICCP).

He then asked for my comments, and in view of my previously expressed support for the CDP examination and the institute, he certainly deserves to get them. The printout (reproduced

The Taylor Report By Alan Taylor, CDP



alongside) is a failure notice sent out after the 1974 CDP examination by the ICCP Certification Council.

Apte, who passed four parts of the examination in 1973, faults the printout for being confusing and arrogant; raising more questions than it answers. He certainly seems to be right.

The first part says he has to take Systems Analysis and Design again — while he read the second part as showing that he achieved a "passing" grade in Systems Analysis and Design. That's confusing enough for anybody! (In fact, the "60%-PASSING" designation refers to the range between 60% correct answers and the unspecified passing mark. It is not a designation of 60% as passing.)

Apte could have pointed out the incredibly arranged layouts with the date, name, address and

failed-section fields all having different starting points, instead of being lined up with each other.

He could have pointed out the anonymous signature — "The Certification Council" — while the letterhead gives five names, none of whom are identified as being any part of the council.

He could also have pointed out the lack of a space line between the heading and column titles, and between the column titles and the line items in the bottom of the form. In any case he would have been justified.

He didn't, but he probably knew I would see these anyway.

So I must agree with him that the printout is unprofessional. But I don't agree that the ICCP Certification Council is "the highest level" of our profession. It would be nice if it were and my hopes for the institute are based upon the assumption that sometime in the future it may earn that accolade. But today it has no genuine claim to such a position, although it does possess an impressive title.

The Certification Council is a group of people who were forced on the institute as a precondition to turning over the CDP examination to the group. New members of the committee are still selected secretly, as they were under the Data Processing Management Association (DPMA), by the council itself — not by the profession. One apparent prerequisite for

membership is that a council member must have a willingness to carry on with a 10-year old method of handling a professional examination, leaving the validation of the examination to an inadequate statistical examination, instead of having it validated by Educational Testing Services or some really independent group. (True, some council members think of themselves as being radicals, but as one ex-member, Dr. William Horn, said to me while he was still on the council, "If they don't like what I'm saying, I am always willing to resign, and I've told them that.")

Even a revolutionary on the council would not disturb the powers-that-be if they have the agreement to resign when they wish! With that sort of setup, I simply can't accept the ICCP Certification Council as having earned any really high professional level so far. Sorry about that.

© Copyright 1974 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. Views expressed in this column do not necessarily reflect those of Computerworld.

NOTICE FOR CERTIFICATION OF COMPUTER PROFESSIONALS

For the purpose of the examination, the following information is required:

1. Name (Last, First, Middle Initial)

2. Address (Street, City, State, Zip)

3. Date of Birth (Month, Day, Year)

4. Date of Examination (Month, Day, Year)

5. Date of Issuance (Month, Day, Year)

6. Date of Expiration (Month, Day, Year)

7. Date of Renewal (Month, Day, Year)

8. Date of Cancellation (Month, Day, Year)

9. Date of Reinstatement (Month, Day, Year)

10. Date of Revocation (Month, Day, Year)

11. Date of Suspension (Month, Day, Year)

12. Date of Termination (Month, Day, Year)

13. Date of Resignation (Month, Day, Year)

14. Date of Death (Month, Day, Year)

15. Date of Withdrawal (Month, Day, Year)

16. Date of Rejection (Month, Day, Year)

17. Date of Disqualification (Month, Day, Year)

18. Date of Ineligibility (Month, Day, Year)

19. Date of Incompetence (Month, Day, Year)

20. Date of Inactivity (Month, Day, Year)

CDP Validation Cost Low, Hidden

The validation of the CDP examination, a prime responsibility of the ICCP Certification Council, is not given as a separate item in the institute price, but is included with the work of initial computer grading and response analysis. However, as this totals \$4,400, \$2,200 for validation seems to be reasonable.

This compares with other figures* such as:

\$15,150 — Administrative Salaries

\$13,192 — Clerical Salaries

\$11,900 — Printing

\$4,400 — Descriptive Analysis of Candidates

Can a Certification Council which year-in, year-out puts such a low emphasis upon examination validation be regarded as being "the highest professional level."

*Figures taken from projected costs on 1974 examination.

This letter announcing the result of the 1974 CDP examination puzzled the recipient, Manohar D. Apte, as it seems to show he achieved a 60% passing mark — and yet failed in Systems Analysis.

Problems of Program Design Perplexing

The following are some of the problems William Simmons would like to see discussed in a feature on program design.

- Is it possible to identify common logic structures that cover many problems? RPO seems to be based upon a generalized processing cycle. The balance line or low-key methods of collating sequential files is another example. Are there others?
- What are the practical considerations governing the PERFORM or CALL decision? How do other experienced programmers go about deciding when to make a part of a program a separately compiled module?
- Is it possible to use the CORRESPONDING option effectively? Can one cut down on detail coding without accepting an intolerable amount of qualification? What effect does this have on the size of each separately compiled module?
- What is the best way to organize the Working Storage in a program that utilizes several CALLED modules? Should the Working Storage be all in the mainline program or distributed to submodules? Can the Working Storage be used by one submodule by reutilized by another submodule for economy of storage? How can this be coordinated with overlay structures?
- How can we best isolate our programs from dependency upon specific data structures? Is there a general file-handling technique?

Professional Practices

'Program Structuring' Fills Gap Between Systems Design, Coding

By William B. Simmons
Social to Computerworld

A lot of ground lies between systems design ideas and coding techniques. This area may not have a very good name, but it can be called "program design," "logic design," or "program structuring," and the fact remains it is a task that is still generally given to programmers.

And the fact also remains that most of us just don't have a good theoretical foundation in designing programs. Coding them is not much of a problem. Designing them is. What we need to know is how to initialize tables, but when to use them.

The concept of structured programming can radically alter the programming trade. Or it can fail to live up to its promise (like so many other DP revolutions) because it was not properly understood.

Wouldn't it be a shame if this important new idea were discredited in the eyes of company managers by those who say: "Structured programming? Sure. That's what I've been doing all along. No trouble at all."

You don't believe it can happen? Well I've already seen it.

Blunder in Design

I'm pretty good at coding programs but I'll confess that I still make the occasional blunder in designing them. Remember that there are thousands of programmers like me. We got into the programming trade the hard way and learned on the job. The companies we work for spend pennies on training and upgrading. And now we're faced with the prospect of revolutionizing the way we work.

I would like to see a regular feature in *Computerworld* dealing with design problems. I know it would be difficult at first to make the thing go, but it could grow into something quite powerful.

William B. Simmons is a programmer in Montreal, Quebec.

Letters to the Editor

DP Manager Finds Ways To Save on Paper Usage

As a manager of data processing in these times of material shortage I have had to devise ways to save and still keep the department going as normal.

I feel that other managers are confronted with similar problems. However, I do not hear anyone talking about it.

Saving paper was my biggest concern and project. I have managed within two months to save about 20% of my normal paper usage.

I would like to pass along some of the ideas in hopes that they may help others and others will begin sharing ideas which they have devised:

- Cut back the number of copies which were being printed.
- My findings were that people receiving the reports read them and then discarded them. We decided that managers could share reports.
- Condensed the printing by increasing the line counter per page, decreasing the spacing between print lines and increasing the lines per inch from six to eight.
- All programs which were compiled were single spaced.
- Insisted that more desk checking of programs be done, eliminating unnecessary copies.

L.J. Peterson
Manager of Data Processing

Wishire Electronics/
New England
Cambridge, Mass.

EVER WONDER WHAT YOUR COMPUTER'S DOING ... AND HOW WELL IT'S DOING IT?

OUR 360/370 Utilization Reporting System HAS THE ANSWERS...

- Performance Measurement
- Customer Billing
- Cost Distribution
- Thruput Analysis
- Software Evaluation
- Operations Monitor

... and others - limited only by your imagination

Johnson Systems provides the most widely used and comprehensive computer utilization reporting system in the industry.

And there are a multitude of good reasons why.

We did not try to "second-guess" your installation's reporting requirements. The system features a flexible report generator which allows you to design your own utilization reports. We also provide a set of control cards defining a host of standard reports to complement your repertoire of custom-made reports.

Our OS version accepts the SMF data base provided by MFT, MVT, VS1, VS2 and VS3 operating systems. In addition, the report generator can simultaneously accept our standard DOS data base.

A DOS-only version collects computer utilization data available via the job accounting option in the supervisor. The report generator subsequently processes this data according to user specifications. Accounting data available from GRASP and ASAP spooling systems can be processed too.

The system has been designed to maximize ease of operation. It's so simple - people use it.

We could go on and on about the advantages of our system and the things it can help you accomplish. Write or call us today, and we'll be pleased to send you more information about our product.

FAST BECOMING THE STANDARD

Johnson Systems, Inc.

PAN-WHAT?

Standard Assembler? — Part I

'Unisym' Discounts Differences Among Minicomputers

By John J. Archer

Special to Computerworld

Our entire approach to the problem of a standard Assembler for minicomputers centered around the idea of mapping a defined system onto a defined set of minicomputers (target machines). Before the "unisym" system could be defined, the set of target machines had to be defined with respect to memory structure, register properties, interaction between registers and memory, address modes supported and instruction set properties.

The problem was simplified by not considering (in the initial stages) input/output and interrupt properties of target machines.

Once this information was collected and listed in a systematic way, it was used in defining the universal language and the virtual machine. The target machines used were:

Allied Business Systems Ltd. — GRI-99
Auratus Electronics Ltd. — A18-D

Computer Technology Ltd. — MOD-I
Data General Corp. — Supernova
Digico Ltd. — Micro-16V
Digital Equipment Corp. — PDP 11/45

Synergy Software Ltd. has recently completed a feasibility study on behalf of the National Computing Centre Ltd. (NCC) to estimate what sort of cost, in terms of program storage and execution time overheads, would be necessary to attain transportability of Assembler-level software over a range of minicomputers [CW, March 20]. Synergy's approach, estimates and conclusions are detailed for *Computerworld* by John J. Archer, the company's chief design consultant.

General Automation, Inc. — SPC-16
General Electric Co. Ltd. — GEC-2050
Hewlett-Packard Co. — HP-2100A
Honeywell — H-716
The system derived from the properties

of these machines is called the Unisym (UNIFIED SYMBOLIC standard terminology) system. Briefly, the virtual machine consists of two accumulators (ACR₁, ACR₂), two index registers (XR₁, XR₂) and a nonpage memory containing two autoindex registers (AXR₁ for incrementation, AXR₂ for decrementation).

All registers and memory locations are defined to be 16 bits long; the accumulation and index registers can perform arithmetic and logic operations and the index registers can also be used for indexed addressing modes. Data transfers are possible between any two registers and between any register and any memory location.

Address Modes

The virtual machine supports direct and indirect (multilevel) address modes containing the submodes relative, indexed, relative indexed and double indexed addressing. In addition, the machine supports literal operand and autoindex addressing.

The Assembler language was derived by NCC and modified where necessary by Synergy. The language contains four basic groups of operations — move, arithmetic, logic and program control. In general, each instruction contains an operator and two operands (receiver and supplier).

A receiver can be a register or a memory location, and a supplier can be a register, memory location or literal operand. An operand can have any of the address modes mentioned above, instructions can be labeled and commented and comments could appear on separate lines. The general form of an instruction is:

RECEIVER OPERATOR SUPPLIER

(possibly prefixed by a label and post-

tion, release of unused file space once the actual space requirements are known, and the deletion of input files once closed.

Edos/30 can accept without change programs and files already in use under DOS.

The basic Edos/30 is available now for \$360/mo on a 30-day lease, or \$325/mo under an annual plan. The DSM feature costs an additional \$100/mo, or \$75/mo under the same arrangements.

The company is at 11 N. Sixth St., 32129.

'Autoflow II' Options Updated

PRINCETON, N.J. — IBM 360/370 users have more support than before in program development, testing and documentation with facilities recently added to Autoflow II by Applied Data Research, Inc. (ADR).

The Module Analysis Processor (MAP) for Cobol — which analyzes individual programs, providing cross-reference listings and program flowcharts — includes a Critical Variable Analysis feature. This identifies all variables tested to determine a program branch, the company explained.

MAP for assembly programs has been extended to include more cross-referencing capability, a composition feature — said to permit the program to be simplified for analysis and debugging — and an "English translation" that expands assembly coding into Cobol-like English.

Meanwhile, the Extended Text Composer (ETC), a word processor for creation and maintenance of texts and documentation, has been enhanced with an automatic index and an amendment facility.

Autoflow II's Cross Program Auditor (CPA) analyzes and reports on groups of programs designed to work together, to insure that data is structured and handled consistently. A data name glossary which lists all data names appearing in the set of programs has been added.

CPA has also been extended to analyze data defined in the Working Storage.

Autoflow II is available under permanent license for \$4,000 plus the cost of at least one of the three options: either MAP (\$2,750) CPA (\$3,300) or ETC (\$2,750).

ADR is at the Route 206 Center, 08540.

fixed by a comment.)

The level of the operators is, in general, held to the same level of the operators of target machine Assembler instructions. The language contains 26 operators and no condition-register processing capabilities. This means all conditional jumps employ data tests on actual registers or memory locations.

Because of the high mnemonic content of the language and its near-symmetry with respect to operands, it is very easy to learn and extremely flexible with respect to the types of operations that can be performed.

When a program is written in Unisym and compiled for a target machine, the resultant machine code should have relocatability and reentrancy. For maximum use and benefit, it was decided that true relocatability of machine code should be attained.

Reentrancy can only be achieved automatically by the production of machine code which is unmodifiable during program execution and stack processing functions.

The subject of stack-handling was not addressed during the course of the study, since this is a modular concept and could be added later. However, it was important to ensure that unmodifiable machine code be produced from source Unisym instructions.

The next part of this report will outline the mapping of the Unisym system onto the target machines.

Source Library Aids B3500, B4700 Users

ST. PAUL, Minn. — Users of Burroughs medium-scale systems — the B2500, B3500 and B4700 — can have audit control over changes with the Program Library Control System from First Computer Corp.

This independent's system is said to simplify the operating procedures required for compilation and testing. It also provides "disaster-storage" for source programs through four-week retention of backup tapes, the company noted.

Listings of both source and object code can be produced as the control system works through the compilation process. There is also a flowchart generation option, the company noted, providing a graphic description of the program logic.

A directory of all source programs, the system and statistics on their activity is printed weekly as a control document.

The complete control system operates in 17K bytes of storage, plus disk space required for the library itself. The package costs \$4,500 installed and is available now from the Software Sales Division, First National Bank Bldg., 55165.

Work Smarter, Not Harder. Get the MMS General Ledger.

Doing the best job doesn't mean always doing the hardest work.

One of the smartest moves you can make is to install the MMS General Ledger. It's more than a software package.

It's a complete corporate financial reporting system, which offers unusual flexibility because of unique data base design. And it can be used under DOS, O/S, IMS or even TOTAL. Best of all, MMS General Ledger is reliable, accurate and based on work for more than 100 major corporations in the U.S. and overseas.

Put the MMS General Ledger—World's No. 1 seller—to work for your company. It's easier than doing it yourself... and very smart.



Please send me more information on your hard-working corporate financial reporting system.

☐ General Ledger ☐ Accounts Payable ☐ Accounts Receivable
☐ Payroll

name _____ title _____ system _____
company _____ address _____ zip _____ phone _____
city _____

SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810 (617) 475-5040
New York (212) 672-8540 Chicago (312) 728-7410 Atlanta (404) 255-0038
San Francisco (415) 371-0321 Los Angeles (213) 437-3201

Epoch 4: A solid-gold investment.

The good thing about putting information on Epoch 4 is that you get back exactly what you put in. No more, no less.

Because Epoch 4 is 100% certified, you can be sure that your data will read and write correctly

every time. That means automatic savings on downtime and overtime.

And, because Epoch 4 is protected by a 20-year warranty, you can spread your investment over that period, too. This means

you end up paying something like 6¢ a month per reel for the finest broad spectrum computer tape you can buy.

Epoch 4. It's as good as investing in gold. Maybe even better.



**GRAHAM
MAGNETICS**

Plano, Texas 75074

'Global' Builds Assembler Source Code

NORTH SYDNEY, Australia - IBM 360/370 users gain the run-time efficiencies of Assembler and the coding-time efficiencies of a high-level language through the use of the Global programming system from DP Developments Pty. Ltd. (DPD) here.

Global output is source code for IBM's Assembler, and the system includes support for assembler instructions in line with Global statements, including all user and IBM-provided macro instructions. Utilizing the Assembler as the ultimate step, Global users can take quick advantage of IBM-provided support for new devices "since it usually shows up in the Assembler first," DPD said.

User-level programming is done on a pair of special coding sheets similar to those used in RPG.

'Debe' Remade for VM

NEW YORK - Standard Data Corp. has introduced CMS Debe, a file utility program to run under Conversational Monitor System for IBM's Virtual Machine Facility (VM/370).

An updated package based on IBM's Debe - "does everything but eat" - for OS and DOS.

Standard's CMS Debe also includes many features of the Ditto utility that replaced the original Debe. Only those Ditto capabilities that are irrelevant to VM/370 operations are missing, Standard claimed. CMS Debe provides the user with the ability to manipulate files and obtain listings or hex dumps of them.

Geared to the time-shared environment of CMS, the new Debe is invoked by typing 'DEBE' while in CMS command environment.

CMS Debe can be purchased for \$1,000 from 1540 Broadway, 10036.

Magazine for Schools

Asks Funds, Features

CONCORD, Mass. - Students and teachers in colleges and schools may be able to share computer-based games, simulations, problems, exercises, curriculum materials and ideas through the columns of a magazine planned for initial release this fall.

Creative Computing deals with computers and related devices in various academic areas and in DP career education, according to David Ahl, the publisher. Computers can make learning fun, he said adding, however that the new magazine, to be published bimonthly, will not be as whimsical as the *Peoples Computer Co.* tabloid, nor as serious as various other periodicals already available.

Ahl expects to run *Creative Computing* as a nonprofit project, with support - financial and editorial - from any interested people, companies, schools or foundations. Charter subscriptions (\$6/yr) are being accepted and sponsorships for more substantial contributions are encouraged, Ahl said.

Various articles have already been contributed, but "anyone with any ideas could really help the teacher work with computers" should feel free to contact *Creative Computing*.

The magazine offices can be reached through P.O. Box 1036, 01742.

The system's use of a limited number of reserved words means, however, that it can be learned easily by programmers who are used to Cobol, PL/I or Assembler itself, as well as RPG.

Trainees take to the Global programming "easily," the company said.

Running through the Global edit and generation steps before the Assembler adds between 10% and 25% to the assembly time on a 360/30 with 2314 disks operating under DOS, DPD admitted, but programmer coding and testing time is cut in half with the new system, a spokesman claimed.

Available Now

Global for DOS users, in either "real" or VS environments, is available now with an upward-compatible OS version under development. Global is currently available only in Australia, but DPD has had "approaches from two large international companies to obtain Global marketing rights," the spokesman said, adding "we expect to conclude these arrangements shortly."

In Australia, Global can be purchased for about \$36,000 or rented for approximately \$1,100/mo. DPD is at 221 Miller St., North Sydney, New South Wales, 2060.

TLMS-TAPE LIBRARY MANAGEMENT SYSTEM

In its 6th year of growth, TLMS is:

- ▶ A real-time tape inventory data capture and tape dataset control system . . .
- ▶ An on-line data base of tape dataset information for inquiry . . .
- ▶ Security protection against accidental destruction of live data . . .
- ▶ Clean interface to OS/360/370, compatible with MVT, MFT, ASP, HASP, VS1, VS 2 . . .
- ▶ Optional external labels in real-time . . .
- ▶ Tape history and quality control.

May we tell you more?

Gulf Oil Computer Sciences, Inc.
P. O. Box 2100
Houston, Texas 77001
713/228-7040



370/165 FOR LEASE

- Guaranteed October Delivery
- Rates as Low as 45% of MAC
- Term 1 to 6 Years
- 0, 2 or 3 Megabytes
- Seven Channels
- IBM DAT Available

NO BROKERS PLEASE

CALL: LARRY GOICHMAN
ALANTHUS CORPORATION
(914) 428-3703



alanthus

Cut out for Colorado.

The Brandon 1974 Summer Institute
The Stanley Hotel in Estes Park, Colorado
August 19-23, 1974

STRUCTURED PROGRAMMING AND DESIGN

Here's an unusual opportunity to participate in a comprehensive institute devoted exclusively to teaching structured programming and design techniques. We're bringing together the most noted authorities in the field to conduct 9 distinct courses and workshops—each separately oriented for management, programmers, system designers. Mail this coupon or call for additional information.

To: Gary Slaughter, Manager of Training Services

Brandon Applied Systems, Inc.
1611 North Kent Street, Arlington, Virginia 22209

Please send complete details on The Brandon Summer Institute

Name _____

Organization _____

Street _____

City _____

State _____

Zip _____

Telephone _____

CALL REGISTRAR (703) 525-2620

School Days

The following is a sampling of public seminars and workshops scheduled during the next month and a half. When two prices are shown, the first is for members of the sponsoring organization; the second, for non-members.

July 13-14 - Workshop on Interactive Computer Graphics
Boulder, Colo.; \$45/\$50;
ACM/Siggraph, c/o James Foley, Department of Computer Science, University of North Carolina, Chapel Hill, N.C. 27514.

July 15-17 - Conference on Computer Graphics and Interactive Techniques; Boulder, Colo.; \$50/\$60; ACM/Siggraph and University of Colorado, Bureau of Conferences, 970 Aurora Ave., Boulder, Colo. 80302.

July 15-19 - Regional Conference on Measurement and Evaluation of Computer Systems; Williamsburg, Va.; funded by National Science Foundation, Dr. S.W. Katze, College of William and Mary, Department of Mathematics, Williamsburg, Va. 23185.

July 22-24 - How to Develop DP Standards; Washington, D.C.; \$375; Brandon Applied Systems, Inc., 1611 N. Kent St., Arlington, Va. 22209.

July 22-24 - Designing Computer-Based Payroll Systems; Atlanta*; \$380/\$440; American Management Association (AMA), 135 W. 50th St., New York, N.Y. 10020.

July 22-24 - EDP Planning; San Francisco*; \$395; Institute for Advanced Technology (IAT), 6003 Executive Blvd., Rockville, Md. 20852.

July 22-24 - Effective Management of DP Projects; New York*; \$395; IAT.

July 22-24 - Advanced Data Base Design and Implementation; New York*; \$395; IAT.

July 22-26 - Senior Systems and Procedures; Toronto*, \$495/\$570; AMA.

July 24-26 - Program Performance Measurement and Optimization; New York*; \$395; IAT.

Aug. 5-7 - Computer Auditing and Control; San Francisco*, \$395; IAT.

Aug. 5-6 - Data Base Concepts; Chicago*; \$295; IAT.

Aug. 7-9 - Data Base Structures and File Organization; Chicago*; \$395; IAT.

Aug. 7-9 - Business Applications of Minkomputers; New York*; \$395; IAT.

Aug. 12-13 - The Role of the Data Administrator; Washington, D.C.*; \$295; IAT.

Aug. 19-23 - Structured Programming and Design; Estes Park, Colo.; \$200 to \$700 depending on days enrolled; Brandon Applied Systems, Inc., 1611 N. Kent St., Arlington, Va. 22209.

Aug. 19-21 - Data Base System and Concepts; Implementation Planning; NYC*; \$425/\$485; AMA.

Aug. 27-29 - Engineering Measurements of Man-Machine Performance; Washington, D.C.; \$315; George Washington University, Continuing Education Program, Washington, D.C. 20006.

*Also scheduled for other cities later.

If you're interested in a practical approach to the design and implementation of data base systems, vote 'yes' below.



Data Base Systems can be very effective EDP tools. But they can also be a waste of computer time and memory. The difference lies in effective planning, system design and management. And this proposed course can give you both the information and the basic experience you need for proper design and implementation of a data base system.

Course topics include all aspects of Data Base Management.

Here are some of the subjects to be covered in this comprehensive seminar:

- The difference between file oriented and data base systems.
- The criteria for record design and distribution.
- Optimum file organization and indexing techniques.
- The problems of data assurance and the techniques for resolving them.
- Design layout and formal implementation specifications for the data base system.
- All available indexing techniques and their applications.
- Implementation techniques for efficiency in system performance.
- All aspects of system management.

Workshops let you learn by doing.

Doing is the best way of learning. And before you're finished Data Base Management you'll have "done" a complete, on line order entry/inventory management system. You'll accomplish this in four workshops, which follow instructional sessions in each segment of the course. So you'll get the information you need, then sit right down, and apply it. It's a technique that has proven to be very effective, and it's an integral part of this seminar.

Seminar created and run by Leo J. Cohen and staff of Performance Development Corporation.

We selected this seminar for possible inclusion in the EDP Seminar Series after watching it in action. It was developed by Performance Development Corporation under the direction of its President, Leo J. Cohen, a nationally known consultant in data base systems. Mr. Cohen will continue as seminar director, and the seminar leaders are PDC staff who are experts in their own right. They include Alan Stutz and Steve Robinson, both of whom are well known for their work in this area. All instructional staff have been involved in design and implementation of a variety of data base systems for major U. S. companies.

Who should attend.

If you're going to be involved in the design and implementation of a data base system—whether as the DP Manager, Data Base Administrator, planner, analyst or programmer—then you should be at this seminar. It will help your department, your company and you!

Vote 'yes' today.

Whether or not we hold this seminar will depend on your response now. If interest is sufficient, we plan to hold these seminars in several cities this fall. When the decision is made, we'll send you an advance brochure and registration form, giving you first chance to enroll. So, if you're interested send in the coupon now. There's absolutely no obligation.

Data Base Management

—prepared by Performance Development Corporation



sponsored by



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

To: Ed Bride
Vice President, Editorial Services
Computerworld
797 Washington Street, Newton, Mass. 02160

☐ Yes, I am interested in your Data Base Management Seminar. If you decide to go ahead, please send me a brochure and registration form. If these seminars are held in the fall, I would prefer to attend in the following city:

☐ New York ☐ Boston ☐ Denver ☐ Chicago ☐ Los Angeles

☐ Check here if you think other people from your company would like to attend with you. (We are considering a reduction in the planned \$350 fee for multiple registrations.)

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone (____) _____

Turnkey Trial

User Tests CRT/Software On-Line System

By Patrick Ward
Of the new staff

SAN MATEO, Calif. — The first user testing a combined CRT and TP monitor on-line systems package is finding the transition from his old batch environment a smooth one so far.

California Casualty Management, Inc. has entered a free two-week testing period of an on-line package jointly offered by Wyle Computer Products, a terminal maker, and GBA International, which markets the Swift TP monitor.

The two firms will install Wyle CRTs and Swift in any interested DOS user's shop in the Los Angeles and San Francisco areas, if the user is considering adding on-line capability.

In cases where a 360 user does not have enough core to allow adding on-line capability, a third firm, Information Control Corp. of El Segundo, will provide the necessary add-on core on a free trial basis.

The Swift TP monitor is "very easy to use; you don't have to retrain all of your programming staff," commented Ron Smith, computer operations manager at California Casualty.

Smith said he plans to bring up a usable accounts receivable inquiry application during the trial period to show his users what he can do for them by adding on-line capability.

Installation of the Wyle hardware and the GBA software took about two hours at his site, Smith said. One of the local terminals is in the computer room for programming debugging; the other is in a conference room for demonstrations.

Though GBA representatives have offered to write applications programs for California Casualty, the company's own staff elected to write the test application program to learn how it was to work with the on-line system.

"This is not a test for users but a test for us," Smith noted.

"It does seem to be going along very smoothly, and with very little effort we seem to be able to tap into our accounts receivable file for inquiry purposes. I'm impressed from that standpoint," added Ralph Wells, director of information services for the firm.

California Casualty's DP shop operates a 256K IBM 360/40 under DOS with eight spindles of Memorex 2314-type drives.

California Casualty is running batch work in two partitions, and had been using Software Design, Inc.'s Grasp spooler in a third.

Software Design provided a version of Grasp which established its own fourth partition, freeing a partition for the Swift TP monitor.

2260 Capabilities

Wyle's CRT Model 8000 is an IBM 2260-compatible device that has a

1,920-character screen, the same bit/sec rate as an IBM 3270 and everything else that is optional on a 2260, a Wyle spokesman said.

Swift occupies between 30K and 50K of real core, according to a GBA spokesman. Yet Swift "has all the facilities of CICS," plus facilities CICS doesn't have. Most notable of these is programming ease, he said.

All the I/O

"The reason is that... Swift does all the I/O for you, not only to the tubes, but to your files." So in a Cobol program, "you have working storage and procedure division, that's it. There's no consideration of files whatever." The Swift system, as installed, handles it for the user, the spokesman added.

Programmers writing new applications for CICS tend to come in after hours when the monitor is down, the spokesman commented, but Swift allows the

programmer to put in a Cobol deck and work with a debug aid on one CRT without disturbing production use on the other CRTs.

Swift supports Isam, Direct, Total, Bomp, Dbomp and Segam, the spokesman said.

In the two-week trial runs, GBA expects to provide such applications as simple inquiry, on-line update and data collection applications for users.

Two Year Lease

A typical configuration of eight Wyle 8000 CRTs leases at \$900/mo on a two-year lease.

The Swift package leases at \$500/mo on a 30-day cancellable lease, or \$400/mo on a two-year lease. Maintenance for Swift and the user's DOS system is included.

Wyle Computer Products is at 13130 Yukon Ave., Hawthorne, Calif. 90250. GBA International is at 2670 Leavenworth St., San Francisco, 94130.

ICDMA Objects to A&T's DDS; Says Non-Bell Units Eliminated

By Ronald A. Frank
Of the new staff

WASHINGTON, D.C. — A&T's proposal for the Dataphone Digital Service (DDS) results in "an effective economic ban on substantially all interconnection of customer-provided equipment," an industry group has told the FCC.

Commenting on the DDS application, which is scheduled to take effect on July 18, the Independent Data Communications Manufacturers Association (IDCMA) said the service effectively prohibits data users from direct connection to private-line facilities. This "has always been permitted in cases of interconnection of customer-provided equipment to private lines under Tariff 260," IDCMA said.

The prohibition is caused by the requirement that users connect to DDS either through an A&T-provided Channel Service Unit (CSU) or, at the user's option, an A&T-provided Data Service Unit (DSU). The FCC was told. The DSU would allow the user to provide signal conversion, timing recovery and logic circuitry.

Analog Restrictions

Also of concern to users is the requirement that A&T's proposed on-line or extension arrangements of DDS to analog facilities would restrict customers to Bell data sets. This is because the ONA would be located in an A&T office and would consist of at least a data set, buffer and

DSU, the IDCMA comments continued.

The restrictive "no-mix" provisions against the use of noncarrier equipment is "an absolute bar on the use of customer-owned or provided data sets." And even if the no-mix provision were removed, customer-provided equipment would still have to be "technically compatible with Western Electric units," IDCMA said. The net effect is that equipment operated by customers today will not be useful "anywhere for DDS analog extensions," and this in turn demonstrates against customers who own their own modems.

Lower Failure Rates

Supporting the DDS application, Packet Communications, Inc. (PCI), which is planning a packet-switched communications network, said the "simplified interface units on A&T customer premises... promise far lower failure rates and shorter repair times" compared with more complex analog modems. PCI said it approved of A&T's provision to allow for leasing DDS facilities to Composite Data Service Vendors, which is Bell's terminology for packet-switched net carriers.

Also objecting to the DDS plan were MCI and Datran. Among those endorsing the service were the National Retail Merchants Association, McGraw-Hill and American Satellite Corp.

The DDS proposal will go into service unless suspended by the FCC before the effective date, an FCC staff spokesman said.

IBM Modem Handles 4,800 Bit/Sec Data

WHITE PLAINS, N.Y. — IBM has expanded its line of modems with the addition of a 4,800 bit/sec unit.

Designated the 3874, the modem can operate with the 2701, 2703 line controllers and with the 3704 and 3705 front ends. It is also compatible with the 3735, 3780 terminals, the System/3 and System/7.

On dial-up lines, the 3874 can be equipped with auto call and auto answer features. On private lines the modem can be configured for either multipoint or point-to-point circuits including "multipoint control" for a central site modem or "tributary control" for remote site. In multipoint nets six remote modems can be connected to a central site.

The 3874 can be "shared" by as many as three terminals at one location although only one terminal can be handled at a time and all switching between terminals is done manually.

The modem has a half-speed capability for communication over temporarily deteriorated lines. A feature allows the 3874 to be switched from a dedicated line to a dial network in the event of line failures. The device automatically makes initial signal acquisition adjustments and has diagnostic capabilities that help identify modem, line or terminal failures.

The new modem is available under IBM extended-term rental, which provides for a two-year contract period, at prices ranging from \$155 to \$265/mo, depending upon features selected. Users with shorter term needs may use the IBM rental agreement with monthly charges ranging from \$183 to \$282. Purchase prices range from \$4,650 to \$7,200.

Customer shipments will begin in the first quarter of 1975.

AT&T Shifts on DI

NEW YORK — Users who want to add DI conditioning to their 9,600 b/sec private lines will pay the same charges regardless of whether they use Bell data sets.

An earlier statement, according to AT&T, was incorrect as it applied to the use of DI with noncarrier data sets. "There is no difference in the way charges are applied to a Bell System data set or a competitor-supplied modem."

The spokesman also said Bell had always intended to make DI conditioning available for both the AT&T 209 data set and non-Bell 9,600 b/sec modems. In all cases where DI conditioning is installed, the customer will have to pay a one-time installation charge plus a one-time charge for service terminals, the spokesman said.

With the AJ 630 you get MORE than a Quiet, Reliable, Wide Carriage Terminal.

The AJ 630 Keyboard Printer Terminal gives you quiet, non-impact printing—a minimum of moving parts, remote settings of tabs by the computer, and speeds of 10, 15 and 30 characters per second, just to name a few. (Now available in APL version). But... There's a lot more you can't see: Engineering and manufacturing know-how that

assures AJ quality, our own sales and service staff in over 30 principal cities, and the option to buy or lease... direct from us.

It doesn't end here. You can get Selectronic and Teletype Terminals, too—and a variety of couplers, modems and cassette recorders. Check with AJ; let us show you that we're...

Advertising Dept., Anderson Jacobson, Inc.
1065 Morse Ave., Sunnyvale, California 94086
☐ Send me the AJ 630 brochure
☐ Send me info on your other terminals
☐ Have someone contact me

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
TELEPHONE _____

More than a terminal company

Anderson Jacobson

1065 Morse Ave. • Sunnyvale, CA 94086 • (408) 734-4030

Sales offices in principal cities throughout the U.S.A.

The AJ 630 was designed for the time-sharing user who needs a full 132-character line width and wants quiet, reliable operation. Actually we offer 140 characters and a number of other features which the experienced user appreciates.

David W. Schoenwald, Director of Marketing

MCI, SP Lower Rates to Compete With New AT&T High/Low Tariff

WASHINGTON, D.C. — Two specialized carriers have revised their rates downward in the wake of AT&T's new high/low density private-line tariff which took effect on June 13.

Both MCI and Southern Pacific Communications Co. lowered rates to be competitive with the lower rates now in effect along the major high-density routes of AT&T.

MCI told its users the new AT&T rates were in effect pending a decision by the FCC expected "in three to four months." As an example of the lower charges, MCI said a New York to Philadelphia voice-grade channel will now cost \$172.05, down from \$206.85. This compares with a high-density AT&T charge of \$190.55, down from \$226.80 under earlier private-line rates.

Southern Pacific eliminated its separate charge for network signaling of \$11 per end, and lowered its cost to a flat 69 cents per channel mile/mo. Previously it had charged 95 cents for the first 500 miles and 53 cent/mile beyond.

The rates for local loops were "nation-wide averaged" and changed to a two-tier structure. One level of \$32/mo applies to any intrastate line and \$50/mo plus \$2.10/mile for interexchange facilities. The lower rates bring Southern Pacific down to an estimated 16% below AT&T high-density charges, a spokesman said.

The SP rates went into effect June 18 and affected about 79 channels now being billed, while the MCI rates took effect on June 19.

With Detachable Keyboards

Singer Adds Remote CRT Terminals to System Ten

NEW YORK — The Singer Co. has added two video display terminals (Models 81 and 82) to the distributive data processing capabilities of its System Ten.

Designed to interface with either a 30- or 165 char./sec printer, the Model 81 terminal can provide low-cost or specialized hard-copy printing at remote locations or at the computer site, Singer said. When it is desirable to have more than one display at the same location, a daisy chain option permits several units, separated by up to 50 feet, to share one modem.

The Model 81 may operate with either internal or external modems. Asynchronous communications is at speeds of 150, 600, 1200- and 1,800 bit/sec in Ascii code with even parity. As an option, synchronous communications is available

at speeds up to 2,400 bit/sec.

The Model 82 may be used for input/output inquiry functions such as interrogation of open order files and credit updating of merchandise control files, etc.

Both the Model 81 and 82 have detachable keyboards — the standard display size is 960 characters with a memory expansion to double the display to 1,920 characters — optional keyboard arrangements, protected fields and cursor/edit controls.

With delivery in 30 days, the Model 81 video display terminal is priced at \$4,000 or is available at one- (\$125), three- (\$115) or five-year (\$105) monthly lease rates which include service.

The Model 82 is priced at \$5,000 and also is leased monthly including service for one year (\$135), three years (\$132) and five years (\$130).

Plot-10 Gets 4010 CRT Support

BEAVERTON, Ore. — Tektronix, Inc. has an improved version of its Plot-10 terminal control system for time-sharing systems.

Release 3.0 is available as a software package which supports the Tektronix 4010 family of display terminals.

In addition to the line drawing, scaling and alphanumeric capabilities previously offered, support has been added for the new 4014 and 4015 display terminals and for the optional enhanced graphics module. This support includes provisions

for 4,096-point addressability, hardware dashed lines and hardware point plot. Logarithmic, semilogarithmic and polar transformations have been added, and a new buffered input/output scheme has been devised which the user can adapt to his own system, Tektronix said.

Release 3.0 can be ordered on a paper source tape or on a source card deck for \$325, which includes the user's manual. User's manuals can be ordered separately for \$5 each. Delivery is two weeks.

The firm's address is Box 500, 97005.

Mr. Top Salesman: Let's talk about opportunities

Moving up fast? So are we.

Computer Machinery Corporation Annual Revenues



Tops in your field? So are we. Believe that professional selling is vital to any moving-up company? So do we. Believe in "no-limits" compensation? So do we. Believe that top salesmen should get first crack at management openings? So do we.

We're Computer Machinery. No. 1 in shared-processor data entry. And now No. 3 in remote batch. With the broadest product lines in both markets.

We have some immediate openings—nationwide—for strong sales reps with lots of moving-up potential.

If you've had successful experience in selling data entry, computer mainframe, or related systems, let's compare track records.

No time for fancy résumés. Just pick up the phone and call our direct Marketing Opportunity Hot Line.

Do it now. We're moving fast.

**Computer
Machinery
Corporation**

2500 Walnut Avenue, Marina del Rey
Post Office Box 92300
Los Angeles, California 90009

Call direct. 213/390-2070 collect.

SYSTEMS & PERIPHERALS



Early computer configuration tested at Shell-VN included line printer, three tape drives, two 2314-type disk drives and 48K of core.

Computer Hardware Provides Printer and Core for 1800 CPU

SACRAMENTO, Calif. — The IBM 1800 CPU is getting a lot of attention from Computer Hardware, Inc. (CHI). This firm introduced a 600 line/min line printer, the CHI 1103, and an add-on core memory system, the CHI-1106C. Both systems are low-cost replacements, the firm said.

The printer utilizes IBM 1443 printer attachments and operates on single or multiple-part continuous forms up to 19.5 in. wide. Vertical forms control is provided with a 12-channel paper tape reader. The printer is priced at \$22,500 and leases are available.

The core memory can be added on to both the 2- and 4 μ sec models.

Up to 65K words are available in increments of 8K words with an optional 8K backup. CHI core attaches to the 1800 through slip-on connectors attached to the pin side of the IBM logic gates. Connections are not permanent and can be easily installed or removed, according to the firm.

The core system is priced at \$9,900 for 8K to \$73,500 for 65K with an 8K backup. Leases are available. CHI is at 2424 Arden Way, 95825.

DEC Offers 3 School Packages

MAYNARD, Mass. — Three minicomputer systems developed expressly for use in secondary schools and colleges have been introduced by Digital Equipment Corp. (DEC).

Designated the Edusystem 100, 200 and 250, the new systems incorporate PDP-11 minicomputers. The systems are designed for expansion so that as needs increase at schools and colleges the systems can be upgraded, DEC said.

Peripherals and computer system options can be added in the field to upgrade the Edusystem 100 to a 200 or 250.

Typical uses of the systems are for student instruction in computer programming fundamentals, other computer science activities, as an aid to students in other areas of study such as mathematics and physics and also for administrative recordkeeping by the faculty.

Edusystem 100 permits up to eight simultaneous users to program in Basic. All of the software required to operate the system resides in core memory.

The Edusystem 100 operates with a variety of terminals, from standard teleprinters to higher-speed Decwriters and CRT terminals. Prices range from \$11,000 to \$32,000.

Edusystem 200 also permits up to eight users to program simultaneously in Basic, but in addition, peripheral storage devices standard with the system permit program flexibility by storing accessible files of data or program subroutines.

Prices for a typical Edusystem 200 will range from \$23,000 to \$36,000.

Edusystem 250 adds the ability to perform foreground/background processing.

Edusystem 250 prices range from \$32,000 to \$54,000.

Uses Cobol Compiler

Two 704 Minis Form Base For Business DP System

By Vic Farmer
Of the CW staff

SAIGON, Vietnam — One of the largest minicomputer installations dedicated to business data processing activities is here at Cong-Ty, Shell Vietnam's (Shell-VN) main office building.

The DP center is based on two Raytheon 704 minicomputers using a limited Cobol compiler. The systems and the compiler were designed by the Honolulu-based The Systems Corp. (TSC) and, according to Hans Harry, finance director for Shell-VN, will result in at least a 30% cost saving compared with traditional business DP systems.

Applications transferred from an IBM 360/40 previously used at a Saigon service bureau include general ledger, accounts receivable and payable, payroll, sales analysis, cost analysis, transport and distribution analysis, capital expenditure control, value-added tax and other tax declarations.

In addition to the two Raytheon 704 minicomputers with a total of 48K of memory, two ISS 2314-type disk drives, six Infotek Vista CRT terminals, four Peritek 800 bit/in. tape drives and a Data Products 132-character wide 600 line/min printer provide the system storage and I/O. TSC itself designed a multiplexer channel for the larger of the two systems.

The systems themselves are not connected — the smaller 704 is used in a typical key-to-disk data entry system, while the larger unit serves as the batch processor with some concurrent interactive processing.

RPG and Cobol Compilers

Software supplied by TSC included a time-sharing file management system and RPG and Cobol compilers. These compilers simplified the program conversion process because some of the firm's programs were created for a 360/20 in addition to the 360/40.

The Cobol compiler was written by TSC's director of system development, Jin Won Park.

His compiler is standard Ansi Cobol minus Call, Sort, Report Writer, Compute and Examine functions. These functions are taken care of by intermixing Assembly language routines into the object decks.

Shell-VN has already placed an order for additional hardware including two more 2314-type disk drives, six CRT terminals, four hard-copy terminals and communications devices to absorb additional work.

Some of the new terminals will be located outside Saigon and will be tied to the computer through radio and wire communications links.

The original system cost slightly over \$200,000 and the add-on will tack another \$80,000 to the system price.

Card-Based Equipment

Before the mini system, Shell-VN used various combinations of in-house card-based equipment and outside time on a 360/20 and 360/40.

The EAM equipment processed data full time using eight keypunch machines.

Additionally, over 40 hours per month were used to run Shell-VN's applications on a 360/20 owned by a local business firm in Saigon. Approximately three hours per month were being used on the local service bureau's 360/40.

An integrated system did not exist, and management was almost reaching the point where it would be unable to adequately control operations.

Shell-VN then decided to convert everything to the service bureau's 360/40, but applications designed to run on the EAM equipment converted for the 360/40 used too much expensive time.

Shell instituted a project to define DP requirements and subsequently to evaluate available hardware.

The results of the requirements analysis and hardware evaluations indicated a minicomputer system would provide maximum cost-effective results while still allowing the desired flexibility of conducting batch and on-line processing concurrently.

The key-to-disk approach to data entry also eliminated punched cards, which have proven unsatisfactory in the tropical climate because of high humidity, termite and storage problems. TSC trained the local maintenance engineers.

Initial reaction of the 25-man DP staff to the cardless configuration has been highly enthusiastic, according to Donald J. Kemp, systems and data processing manager at Shell-VN.

Not only are the programmers working more effectively than anticipated, but the keypunch operators quickly adapted to the terminals. The data entry operators were delighted with the terminals' speed, lack of noise and the ease of corrections compared with the previous card equipment, he said.

The system was accepted by Shell-VN after acceptance tests within one year after the firm instituted its internal study to consider various DP alternatives. Shell-VN, with 1,000 employees, is the largest private company in the Republic of Vietnam and supplies over half the oil market. The firm's activity consists entirely of marketing and distribution, with no refining or exploration work.

talk is cheap



SPEED	80 to 200 lpm
	100 to 600 cps
COLUMNS	80 or 132
BAUD RATES	110 to 9600

CENTRONICS

Introducing the

Our new Flexydisks have been specially designed and formulated to provide trouble-free performance on 3740 and compatible equipment utilizing flexible disks.

Each Flexydisk 1 has 77 tracks and can store up to 252,928 bytes ... or approximately 3,000 80-column cards. There's no better buy than BASF Flexydisks, and here are some of the reasons why:

Flexydisks are 100% Certified error free... and they're initialized.

Every Flexydisk 1 is 100% certified so you won't have mistakes to cope with. Each disk is also pre-formatted for immediate use. Flexydisks

have a clean, debris-free surface like purpose coating gives increased disk life. Head wear to be less than 2% in loaded operation!

Flexydisks won't leave you with errors either. We've coated and finished the disk surface. **Flexydisks are Self-Cleaning.**

We pack our Flexydisks in



Index hole.

Ultra-smooth coating... our special formulation plus unique finishing method gives Flexydisks longer life. 100% certified to be error-free.

Jacket and liner... supports and cleans disk surface, cutting down on errors.



You're already paying for BASF quality.

BASF Flexydisk I

ke our computer tape. A special dual-disk and head life. Our tests have 3.5 micro-inches in 92 hours of head

u short if 3740 equipment is updated, them on both sides. Just to be sure.

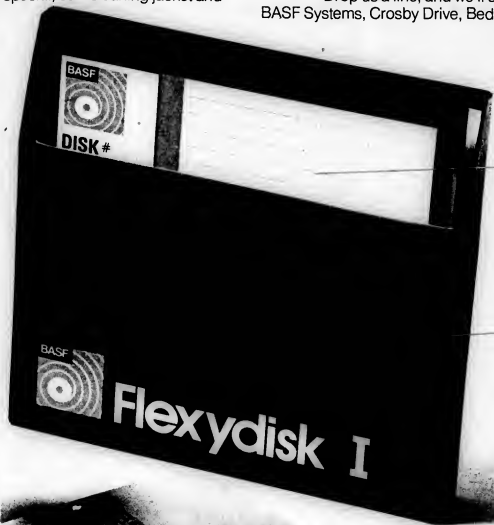
a special, self-cleaning jacket and

liner. This unique method of packaging cuts down on friction and the possibility of errors.

Flexydisks are Easily Stored and Mailed.

A good product deserves a good package. Flexydisks come in compact, tabulated library 5-packs. They save on storage and record-keeping, and make neat desk-top files. They're a great time-saver. A supply of color coded labels is also included for easy job identification.

Drop us a line, and we'll send you complete details on Flexydisks. BASF Systems, Crosby Drive, Bedford, MA 01730.



Color-coded I.D. labels are included for easy cataloging of disks.

Self-storing package... the box serves as a convenient, desk-top file.



Recording area.



ality, you might as well have it.

Cipher Drives Use 80 W

SAN DIEGO, Calif. — Cipher Data's Model 85X and 70X tape drives require approximately 50% less power (80 W) than the firm's previous models.

Low inertia, high torque, direct drive motors operate at speeds of 12.5, 18.75, 25, and 37.5 in./sec.

Using an 8-1/2- or 7-in. reel, the units feature throughput through loading, and an auto-

3M Cartridge Unit Handles 8 Drives

PLAINVIEW, N.Y. — The Series 2400 3M cartridge tape drive system from Qantex uses simplified software requiring only two registers for complete tape drive control and data handling.

It performs all 1/2-in. tape commands. Modular in nature, the system can handle up to eight tape drives, thus incrementing storage in 2.5M-bit steps.

The system is offered in three basic configurations: with no interface, as a tape formatter and complete with minicomputer interface.

Prices start at less than \$3,000 for a tape formatter and drive. An interface for a Digital Equipment Corp. (DEC) PDP-11 costs \$650 from the firm at 200 Terminal Drive, 11803.

Decision Offers S/3 Users Five-Year Lease Plan

HORSHAM, Pa. — Decision Data Computer Corp. has announced a five-year leasing plan for its line of 96-column card equipment for IBM System/3 users. The firm is at 100 Witmer Road, 19044.

Firm Mates Minis, Peripheral

BEDFORD, Mass. — Information Design, Inc. has expanded its regional minicomputer and peripheral interface service to national coverage. The company will do individual peripheral interfacing or accept responsibility for producing a turnkey system. The firm is at Civil Air Terminal, 01730.

matic buffer arm retraction eliminates the problem of arm snap-back during loading.

The units are available in 7-track with a choice of two densities from 200-, 556- or 800 bit/in. or in 9-track in either 800 bit/in. NRZI or 1,600 bit/in. IBM phase-encoded formats.

Prices start at \$2,700 for the Model 85X60 and \$2,450 for the Model 70X60, which are available with continuous write/continuous read and read-after-write features.

Interfaces for most minis are available and range from \$875 to \$1,575 additionally.

The firm is at 7655 Convey Court, 92111.



Tally printer interfaces to Data General Nova minis.

Tally 2000 Linked to Nova

KENT, Wash. — Tally Corp. has introduced a family of printer interfaces and controllers that make the Tally 2000 Series 200 line/min printer compatible with the Data General Nova family and the Digital Equipment Corp. (DEC) PDP-11 minicomputers.

RS 232 Interface

Communications interfaces include an RS 232 "teletypewriter format" serial version for 600- to 1,200 bit/sec operation as an on-line communications printer.

An alternate configuration allows 600- to 9,600 bit/sec serial

operation for minicomputer output.

In addition to the standard Tally parallel interface, other interfaces are available to emulate various makes of printers such as Centronics, Data Printer and Data Products for easy systems integration, Tally noted.

A 200 line/min printer interfaced to a Data General Nova costs \$5,700; one 125 line/min printer, \$5,200. Equivalent prices for a DEC PDP-11 printer are \$5,500 and \$5,200 respectively.

The firm is at 8301 S. 180th St., 98031.

The new GTE Information Systems' IS/7800 Series Intelligent Video Terminals cost an average of 15-39% less than IBM 3270's on one-year rental, and 33-43% less on three- and five-year rentals. Buy them outright, and save 40-50%.

But we don't just cost less. We also offer more: Four character-capacity choices, not just two (240, 480, 960, 1920). Upper and lower case, and double-width characters. Extended character set with bar graphs, charts, histograms and line drawings. Inverted image (black on white). Underlining. Character blink. Impact

or thermal printers at 30-165 cps. Of course, like the 3270, we offer complete addressability of any character on the screen, and an optional light pen.

And everything is truly plug-to-plug compatible with the IBM 3270, and interfaces with IBM 360/370 systems. No hardware or software changes. Even the cables are compatible.

Costs less. Does more. The IS/7800 terminal is microprogrammed to handle today's problems, and can be programmed to meet tomorrow's.

What we're saying is, we not only give you more

**We cost a lot less
than they do
and we do a lot more
than they do.**

IBM 370's

are leased to save money.

CSA leases provide long term economy, while customers enjoy the flexibility of upgrading and early termination.

For further information, please call (800) 462-4671.

**Computer Systems
of America, Inc.**

a subsidiary of American International Corporation

Send for the 12 questions you should ask of any leasing company before you lease

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____
370 on order ☐ installed ☐
Model _____ Due Date _____

GTE Information Systems: One Stamford Forum, Stamford, Conn. 06904, Atlanta, 404-486-1670; Boston, 617-257-5222; Chicago, 312-332-7800; Cleveland, 216-771-4456; Dallas, 214-741-4301; Denver, 313-363-3747; Hartford, 203-663-3767; Houston, 713-690-1713; Los Angeles, 213-360-2300; Minneapolis, 612-854-2898; New York, 212-486-3290; Philadelphia, 215-449-7410; Pittsburgh, 412-391-4170; St. Louis, 314-863-0330; San Francisco, 415-349-2600; Seattle, 206-383-3100; Washington, 202-293-2800; Worcester, 617-866-9324.

Modcomp I/O Can Be One Mile Away

FORT LAUDERDALE, Fla. — The Remote Acquisition Subsystem (Remac) option allows Modcomp mini-computer users to interface I/O hardware at distances up to one mile.

Remac consists of a link controller and a link terminal. The link controller interfaces to the Modcomp I/O Bus through the peripheral controller interface. Device address selection is implemented by switches mounted in IC sockets.

This feature enables the link to respond to more than one

set of device addresses. Two device addresses are assigned to the link; the even addresses correspond to digital and analog outputs and the odd addresses are for digital and analog inputs.

Up to three additional link terminals may be connected to one link controller in a daisy chain fashion. Each link terminal is capable of handling up to four Modcomp process I/O interfaces.

Data transfers between the CPU and the link controller may take place under either test and transfer mode, inter-

rupt mode or DMP mode. The serial link is capable of transmitting and receiving data simultaneously at word rates of 17,400 word/sec at distances up to one-half mile and 8,700 word/sec at distances up to one mile.

The cost of the basic Remac subsystem consisting of the link controller and link terminal is \$3,000. The price for each additional expansion terminal is \$1,800. The Remac subsystem will be delivered in 60 days from the firm at 1650 W. McNab Road, 33309.

Identimat Central Station Polls 16 Security Terminals

NORTHVALE, N.J. — For security conscious users, Identimat Corp. has brought out a central station (CS-1) for use with its Identimat terminals.

The Identimat verifies the identity of individuals by measuring and comparing their hand geometry characteristics to previously authorized data before allowing entry into restricted areas.

The standard CS-1 polls up to 16 stations, records on hard copy every entry and exit (by employee number, time, date and access control station) and

provides lockout and delisting individual for up to 1,000 people.

All unsuccessful attempts to enter sound an audible alarm and the pertinent data is immediately printed out in red.

A CS-1 capable of controlling eight stations costs \$5,000 or less for a 100/mo on a four-year contract.

The firm is at 408 Paulding Ave., 07647.

Reader Carries Double Fiche

MEMONONIE FALLS, Wis. — Realist, Inc. has added a double fiche carrier for its Vantage reader line.

The carrier was designed to answer the requirements of various applications requiring simultaneous use of two standard 4-in. by 6-in. microfiche; such as in an application where one or two fiche might make up an entire system.

The carrier is priced at \$30 from the firm at N93 W16288 Megal Drive, 53051.

Versatec 1250 Proofers Print 1,100 Char./Sec

CUPERTINO, Calif. — Printing hard-copy proofs prior to typesetting, the Versatec Matrix 1250 Proofer Series outputs galley at 1,100- or 500 char./sec.

Both models provide selectable print/no print of phototypesetter instructions. Both use 11-in. wide paper, either roll or fanfold.

The Matrix 1250 P Proofer is linked to the computer with controller interface for use in on-line proofing systems. It prints at 1,100 char./sec.

The unit accepts Ascii signal input, parallel and serial. Recommended operating rates are 600-, 1,200-, 2,400-, 4,800- and 9,600 bit/sec.

Optional serial synchronous interface for use with standard data sets is available.

The Matrix 1250 PTR Proofer System combines Matrix Proofer and paper tape reader to form a stand-alone off-line proofing system. Using Ascii (7- or 8-level) or TTS (6-level designed to use requirements) paper tape input, hard proof copy is printed at 500 char./sec.

Unit price of Matrix 1250 P Proofer is \$8,200; Matrix 1250 PTR Proofer System is \$10,000. The firm is at 10100 Bubb Road, 95014.

for today. We give you tomorrow, too.

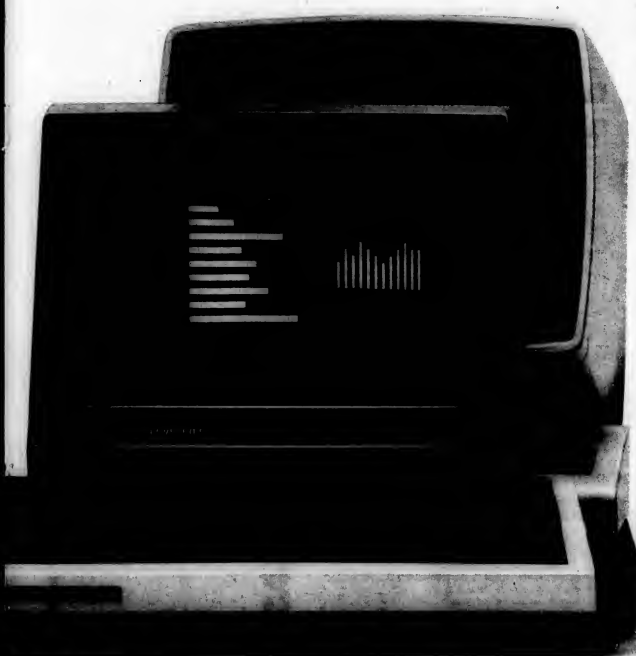
What's more, the IS/7800 is backed by our 700-man service organization working out of 96 locations around the country. And behind them is GTE Information Systems itself.

We're probably the best single source for data communications you'll find. Terminals, modems, multiplexers, controllers. Even programming.

We've got what you need, between you and your computer.

Sometimes the best way to get more is to pay less.

GTE



SHORT TERM
360 LEASES
ROCKWOOD
Computer Corporation

33 W. Tarrytown Road
Elmsford, New York 10523

CALL TOLL FREE
800-431-1781

TO FIND THE OFFICE
NEAREST YOU

COMPUTER INDUSTRY

Different Game Plan?

CI Notes

Race is On in Flexible Disk Drive Area

Cal Data Sues DEC

LOS ANGELES—California Data Processors (Cal Data) has filed a countersuit against Digital Equipment Corp. (DEC) charging infringement of Cal Data's patent for a Language Independent Computer. Cal Data seeks an injunction and \$10 million in damages for past infringement.

In response to the patent infringement claim filed by DEC, Cal Data denied both the validity and infringement of the two DEC patents in suit.

A DEC spokesman said the firm considers the countersuit to be "without foundation."

Graham Licenses Asahi

GRAHAM, Texas—Graham Magnetics, Inc. has licensed Asahi Chemical Industry Co., Ltd. in the manufacture of magnetic tapes.

The agreement covers technological know-how of the manufacturing process. Asahi's manufacturing will be limited to Japan, but the firm retains sales rights for the Southeast Asia area.

Graham is to receive fixed fees for disclosure of its technology, and will also receive royalties on sales made by Asahi.

Silicon Remains Tax Exempt

WASHINGTON, D.C.—The planned reclassification of silicon material as a chemical, rather than as a metal, will not affect its tariff status, according to the U.S. Tariff Commission.

Silicon, an essential material for the majority of semiconductor devices, is presently classified as a metal under the U.S. Tariff Schedule and finished semiconductors are imported under an exemption for metal goods.

The commission is presently drafting new schedules to conform with the "Brussels Tariff Nomenclature," which classifies silicon as a chemical and is the standard nomenclature used in international trade.

Supershorts

Lespac Corp. has agreed to supply leasing agreements to Graham Magnetics, Inc. customers.

Electronic Processors, Inc. (EPI), Englewood, Colo., has filed a patent infringement suit against Redactor Corp. and Data General Corp. The suit claims both firms intentionally infringed a patented recording technique of EPI that is trademarked STR (speed tolerant recording).

BasicFour Corp. has delivered its 1,000th small computer system to Lee Pharmaceuticals, South El Monte, Calif.

By Molly Upton
of the CW staff

The stakes are high, the players numerous and the ground rules somewhat different in the floppy disk drive business as contrasted with higher-ticket DP products.

There is no question there will be a shakeout. The questions are who takes the bullet, when and how.

The floppy drive represents a slightly different type of animal than the larger peripherals.

It is a very low-ticket, low-profit-margin item, thus requiring volume production in order to trim costs even further to allow some semblance of profit.

Starting up production on a Detroit-like assembly line and making tooling and dies for the parts requires a substantial investment not going to yield a return above investment until well into volume shipments, most sources say.

Automated production facilities are not overly common in the DP industry, although one might expect to see numerical control machines doing a variety of jobs.

Testing is becoming more automated, but there is much hand assembly of PC boards and other components, as well as final assembly.

Thus, entering into large volume production of floppies generally requires a different setup than when a firm turns out larger disks.

Some of the larger firms with a broad range of products are counting on sur-

viving to at least the second iteration of the market, relying on other products to see them through the immediate future of lean if any profits.

Some observers are concerned about the smaller firms. On the one hand, they do not have the capital to back them until revenues exceed production costs,

Projections for the floppy market are somewhat hard to pin down, as there are the IBM 3740-compatible and non-compatible markets, and presumably most projections are made for using floppies in DP and related applications such as word processing.

Some figures quoted are 125,000 units shipped in 1977.

Figures Low?

But if floppy drives take off, and no one seems willing to say they won't, and wend their way into consumer goods, such as home appliances, etc., then these figures are grossly inadequate. As the prize seems larger, the temptation exists to pour more and more money into startup efforts and marketing and to wait longer for a return.

Certainly the ultimate design of the floppy drive and media are not yet here, although almost every independent will concede that IBM put some well thought-out features in its 3740.

But even IBM is changing features on its floppies, such as a ceramic head, acknowledged by some to be a beautifully simple, cost effective design. In the 3740, the diskette is dropped into a slot, rather than running the risk of being jammed or inserted askew in the horizontal position.

One maker said of all the media he tested, only IBM's tested 100%. Another said he hadn't had much trouble in this regard and found several suppliers acceptable.

The prices being quoted on large OEM bids are unrealistically low, one observer said, noting he expects the price to rise if those makers that survive the first shake-out want to continue in the business with something resembling a profit.

DP Trade Balance Sets Quarter Record

WASHINGTON, D.C.—The computer and business equipment industry's positive balance of trade reached record proportions during the first quarter.

The total U.S. balance of trade was a positive balance of \$1.31 billion, of which \$473.6 million was generated by the computer and business equipment sector.

The industry exported products totaling \$712.2 million in the first quarter, also a new record, according to figures compiled by the Computer and Business Equipment Manufacturers Association (CHEMA).

The industry exported almost three times as much in volume as was imported, for a ratio of 2.98, which compares with a ratio of 1.2 for all manufactured goods.

Analysis

and on the other, they might tie themselves too closely with a very big, low-priced contract.

This could, if they point out, be equally destructive if the small firms don't allow a sufficient margin for the firms' survival.

Some of the smaller firms have no doubt as to their viability and are already making a name for themselves by providing extensive customer support by extremely capable engineers. This, commented one industry observer, is something the small firms must do, and the large firms are more reluctant to do.

In this race of the masses, including the very large against the very small, the players all know one another, and there seems to be general, widespread moral support for some of the new firms.

The spirit of entrepreneurship is very much alive, and those who occupy desks at large corporations seem almost to be rooting for those who start out on their own.

Comptroller Extends Restrictions On Allowable Bank DP Activities

WASHINGTON, D.C.—The Office of the Comptroller of the Currency has requested the Central National Bank of Chicago, and by implication other banks, to get out of the subscription fulfillment business within three years.

The comptroller's office request is in keeping with the office's recent decision of what outside DP activities banks may legally engage in. The office was acting on a suit for a ruling from Hallmark Data Systems, Inc., a Shokite, Ill. service bureau.

Since 1964

The Central National Bank had been offering a comprehensive subscription fulfillment service in competition with service bureaus since about 1964, according to Wayne D. Smart Jr., vice-president and chief counsel to the bank. He did not disclose the volume of subscription fulfillment business the bank had been doing.

Smart said the bank was considering the request to end its service and had not yet made a final decision.

In an interpretive ruling dated April 15, the comptroller's office noted that "a national bank may use data processing equipment and technology to perform for itself and others all services expressly or incidentally authorized under the statutes applicable to national banks."

'A Technology'

Data processing is merely a technology, and thus, "many services now commonly known as data processing services are not in fact new services simply because computers now are used to perform them."

The comptroller also stated banks may market programs or other products they develop in the course of their DP work, and may market excess time on their equipment "so long as the only involvement by the bank is furnishing the facility and necessary operating personnel."

But the comptroller deemed it "neither appropriate nor permissible for a bank to engage in a general data processing business."

DON'T BUY HALF A SYSTEM! PROCON 3

Procon 3 delivers both project planning and control.

Other systems claim they offer planning. In reality, most don't. The planner must enter the project schedule—in some cases even the project budget. The plan cannot be labeled experimental and altered until it becomes meaningful.

Procon 3 is different. It generates the project schedule and budget. It tells the planner whether resources are available. It then enables him to refine the plan in a simulation mode. Procon 3 really aids the planner but it also offers management the most effective control.

Write and we will be glad to send you material to prove our point.

Craig & Neches
Management Consultants
1888 Century Park East
Los Angeles, CA 90067
213-556-2757

Craig & Neches
Management Consultants
1888 Century Park East
Los Angeles, CA 90067
213-556-2757

Name

Title

Firm

Address

City State Zip

**Meet a
brand new company
with a
15-year reputation for
reliability.**

**The
Components Group
of
Digital Equipment
Corporation.**

**Now you can buy
the components and
peripherals
that support the world's
most popular
minicomputers.**

**Separately.
In quantity.
At extremely low prices.**

From us. The Components Group of Digital Equipment Corporation. A new group, formed to supply reliable computer components to the volume buyer at the lowest possible prices.

Right now, we're offering these proven products. Our new low-cost alphanumeric video terminal, the VT50. The RT01 and RT02 data entry terminals. Our TU60 cassette mag tape system. The PDP-8/A component computer. The MPS microprocessor series. And our M and K Series solid-state logic modules. Additional products will be available in the near future; product families are planned to provide a range of capabilities.

All Components Group products are also used by Digital as components and peripherals in the PDP-8 and PDP-11 minicomputer systems, the most popular minis in the world; the products are compatible with all commonly-used minicomputers. Our components — like our computers — are designed to deliver maximum price/performance.

Until now, if you wanted Digital components, you had to buy an entire system.

Not any more.

Now, if you order fifty pieces or more, you can buy any of these components completely unbundled. Volume buying will get you price breaks you won't believe.

And you can have our components off the shelf. When we've established our nationwide network of warehouse/depots (due this fall), volume deliveries will be made as fast as we can process your order. Digital manufacturing capability — over two million square feet of manufacturing space in the

United States, Puerto Rico, Canada and other countries overseas. These are the same facilities that have produced more minicomputers than anyone else, the facilities that manufacture and test the peripherals that support these computers. To meet your demands in the next year alone we're planning several new plants in the United States and Canada and retooling present production lines to Components Group specifications.

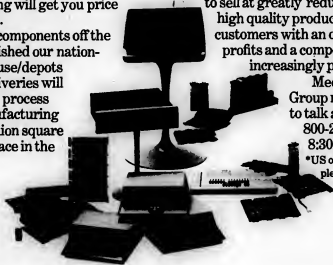
To deliver these components quickly and to maintain our high standards of reliability, the Components Group is planning a network of warehouses. At these depots, products meeting our rigid specifications will be stocked for off-the-shelf delivery.

The Components Group warranty is new and simple: equipment is warranted across the board for a specified time. If anything goes wrong during that time, just return the unit to the nearest depot for quick repair or exchange.

Over the next few years, we expect the cost of computer hardware — especially the cost of the computer itself — to keep going down. Entirely new applications will open up. Volume production of proven components and peripherals enables us to sell at greatly reduced prices. Our low-cost, high quality products will provide our customers with an opportunity for enhanced profits and a competitive edge in an increasingly price-conscious market.

Meet the Components Group now — we've got a lot to talk about. Call us direct at 800-225-9480. Toll-free from 8:30AM to 5:00PM your time.*

*US only. Massachusetts residents, please dial (617) 481-7400.



digital **COMPONENTS** **GROUP**

Unbundling the world's most popular minicomputers.

Digital Equipment Corporation, Components Group, One Iron Way, Marlborough, Massachusetts 01752.
In Canada: Digital Equipment of Canada Limited, P.O. Box 11500, Ottawa, Ontario, K2H8K8, (613) 592-5111.



We MATCH
the computer to the need!
What to BUY, SELL, LEASE or
TRADE computers or peripherals?
Then you'll be dollars ahead working
with a professional data processing
consultant. Our experience and profes-
sional service will take care of your
data needs... and save you money
in the process. Call us now on dial
921-6647.
Let us show more right on the sub-
ject. Call Tom Norris collect at (214)
921-6647.
transdata
P.O. Box 676 • Dallas, Texas 75267
Member of Computer Dealers Assoc.

MOVING?

Please notify *Computerworld* at
least four weeks in advance. When
writing about your subscription,
please enclose a recent mailing
label. The code line on top may
not mean much to you, but it is
the only way we have of quickly
identifying your records. If you
are receiving duplicate copies,
please send both labels.

797 Washington Street
Newton, Massachusetts 02160

Your terminal may be the last of a dying breed.

The terminals and communications systems of tomorrow will be quite different than those of today. And our July 31st Supplement, *Terminals and Data Communications*, will try to provide you with a peek into the future. It will look at topics like these:

- The increasing specialization of terminals, and the reduction of flexibility that goes with it.
- What the terminal based systems of tomorrow will look like.
- The kinds of services and networks that will be available in the future.
- New protocols and new architecture for data communications.

If you'd like to plan ahead, then plan to read this important supplement in our July 31st issue. And if you're marketing in this area, make sure you schedule your ad in plenty of time. Closing date is July 12th. If you'd like more information, just contact your *Computerworld* salesman. Or call Judy Milford at (617) 965-5800.



COMPUTERWORLD

National Sales Office
New York
Dexter Davis
(617) 965-5803

Boston
Bob Zengli
Mike Burman
(617) 965-5803

New York
Eric Faxon
Frank Galla
(212) 461-2575

Los Angeles
Bob Ryan
Joseph Ryan
(213) 477-4238

San Francisco
Bill Haddy
Jerry Thompson
(415) 362-8547

Reaffirmed by 90/30 Small Systems Spurred Univac's Growth

By Vic Farmer
Of the CW staff

NEW YORK—Univac's recent announcement of the 90/30 system [CW, June 26] reaffirms the company's aggressiveness, a characteristic proven by its continued growth over the past eight years, according to Gerald G. Probst, Univac president.

Univac announced its 9000 Series eight years ago for the smaller and medium-scale DP user after it had established the 1100 series. But breaking into the smaller systems really added to Univac's growth beginning about five years ago. "We have managed to top in the past year \$1.5 billion in revenue as of March 31," he noted.

This represented five continuous years of growth and the average growth rate compounded was slightly over 15%.

In comparison with fiscal year '73, Univac had some significant gains in 1974. Commercial activity revenues were up over 15%, shipments were up over 30% and orders were up over 18%.

By the end of the year this gave a backlog for commercial products 23% over the previous year even in the light of the increased shipments made,

Probst said. "This advance in the commercial products sector will give us a good base to continue our growth and a solid platform from which to launch our fiscal '75 figures," he predicted.

Probst attributed the growth in the commercial area to customer satisfaction, a main objective over the past several years.

Last year Sperry Univac's base increased by 12%, which translates to \$5.3 billion currently installed. In the last three years, the firm has more than doubled the number of Fortune 500 customers utilizing Univac products, he said, and "this is indicative of the direction in which we are moving."

OEM Floppy Marketplace Seen Changing

By Molly Upton
Of the CW staff

SANTA CLARA, Calif.—Characteristics of the OEM floppy disk drive marketplace will change, observed A. Keith Plant, director of OEM marketing for Memorex.

Currently the key criteria are interface and price, but a year from now OEM customers will have designed interfaces to accept a variety of drives, and prices will increase on the OEM

In the past three years, the firm has more than doubled the sales of commercial products in the North American Division, and in the same period tripled commercial sales in Europe.

To insure continued growth, Univac has acquired ISS to handle disk and other peripheral development, the RCA super-market checkout system and several distributors in Puerto Rico, Singapore and Hong Kong.

The distributors had limited resources and this move will provide an opportunity to expand the markets in Asia and the Caribbean, Probst said.

Another important step for Univac was the reorganization of

level, he predicted.

There are six or eight viable contenders in the marketplace, many of whom are undercapitalized, he said. Several large contracts are currently up for grabs, and the prices bid by some contestants are reportedly as low as \$250 per drive without PC board, he said.

Keith observed it is quite possible a small firm could grab large contracts, but if it did, it would run the risk of tying up its entire production capability as a very low profit item. This could kill the small, undercapitalized firm, he warned.

A year from now the second market for floppy drives will emerge, much of it from demand to second source the original contract suppliers, he continued.

Makes Mides

Memorex makes its own media as well as heads and drives. The firm offers two drives and media—the 651 and diskette, which are not IBM compatible, and the 652 and diskette, which are IBM 3740-compatible.

Shipments of 651 drives in May totaled 700 units and Plant estimated shipments for 1974 will be in the 9,000 to 10,000 range.

Right now the 651 represents Memorex's chief source of revenues from its OEM disk products, whereas the 651 and Memorex's 2314-type drive, the 660, should tie for the honors by the end of the year.

By the end of 1975, the 652,

CW Photo by M. A. Farmer
Probst

activities in all of Europe using four vice-president nationals to head up each branch. Probst expects this reorganization will allow decisions to further develop markets to be made in Europe.

Just a month ago Probst signed a cooperation agreement with the USSR's Science and Technology Ministry.



Plant

the 660 and 651 should each contribute a third of OEM disk revenues, Plant said.

The Memorex 651 uses a flexible disk that has a thicker coating than that used by IBM, and has 32 sector holes and one index hole around the disk periphery.

The 651 drive and diskette were designed as a complete unit, Plant noted. Memorex warrants the head for 10,000 hours and the diskette for one million passes per track.

Memorex started producing the 652 in March and is beginning volume shipments.

Markets for the drives include word processing equipment, calculators, terminals and data entry systems, Plant noted.

In addition to its 2314-type drives, Memorex is exploring the possibility of 3330-type units in the 100M- to 200M-byte range, he said.



652 Flexible Disk Drives

Spitters Loses Bid For Congress

SAN JOSE, Calif.—A Memorex founder, Laurence L. Spitters, who recently stepped down as top official of the company, lost a bid to win the Democratic nomination for the 12th district congressional seat.

Spitters came in third with 8,873 votes. The winner was Santa Clara Mayor Gary Gilmore, who received 15,780 votes. Second was Thomas Skornia, 13,143 votes, who has been a

spokesman for several local semiconductor companies.

Intel Acquires IPL
SAN FRANCISCO—Intel Corp. has acquired IPL Data Services, Ltd., a firm specializing in the development of computer software for the retail industry.

"This acquisition allows the data services group to enter the retail industry," said William H. Bird, group president.

'Good-News Gony' Struck for Orders

HP's 3000 Sales Exceeding Quota

By Molly Upton
Of the staff

CUPERTINO, Calif. — Sales of Hewlett-Packard's (HP) 3000 system are exceeding quota, according to New Griffin, product manager. To date, the firm has installed over 40 systems in non-HP locations, he said, and is shipping about six a month.

There are two versions of the machine, with configurations designed for the two operating systems, although users are interchanging the software on their systems, he noted.

The 3000 Model 200 is the older version, with MPE software designed for multiprogramming, while the 100, with the new MPET, is designed for time-sharing.

While only released this month, one 100 system has already been sold, Griffin added.

'Image' Language

HP also offers a data management language called "Image."

HP considers its "Image" for the 3000 to come from Digital Equipment's PDP-11/45 with RSTS/11E, he said.

System prices start at \$129,500 and typically run somewhere around \$200,000, Griffin said.

HP is very interested in the \$100,000 to \$125,000 market, he said.

"We know there's a substantial market there, and we feel we have the technology to bring the price down."

One step that will lead to price reductions, as well as assurance of quality products, is manufacturing more of its own peripherals, Griffin noted.

HP now makes its own cartridge disks and tape drives and has started manufacturing printers under a license from Tally. The firm is investigating making larger disks and possibly terminals as well, he said.

Although intended for the end user, HP has signed its first OEM contract for the 3000. The existing sales force will handle OEM sales for the unit, Griffin said.

Since HP has an extensive sales force in the electronics industry, it is putting that to work selling HP 3000s in its ordinary industrial accounts, Griffin said, and

this is working out well.

So far 3000s are installed principally in education and industrial locations, but have also been installed in financial and medical sites.

May was the best month so far for sales of the 3000 since its reintroduction last November, he said.

About 20% of the installed base is outside the U.S. HP would like to double the base in fiscal 1975, and Griffin said he felt confident this would be done.

Griffin has found that company-sponsored day-long seminars around the country have yielded good results. HP conducts an overview session on the system in the morning, and then brings in technical personnel in the afternoon, as well as a local user, to explain the machine's capabilities and applications.

HP's Data Systems Division has installed a "good-news gone" that is struck every time an order is received for a 3000.

"It really wakes people up," Griffin added.

Contracts

TORRANCE, Calif. — The City of Torrance has awarded Computer Sciences Corp. (CSC) a three-year facilities management contract.

The main feature of the CSC program is the conversion of existing operations to distributed processing, which will afford the community of 140,000 the type of management information system usually available only to large cities, the city claimed.

CSC will also implement a program management system to provide timely data on city programs in terms of budget, expenditures and performance. Operations which require large amounts of processing, report printing or data storage will be handled by CSC's time-sharing network Infont.

The contract stipulates that CSC will design programs to

meet the needs of each department, rather than forcing the various departments to adapt to ready-made computer packages.

Other Contracts

Computer Election Systems, Inc. has been awarded a contract by the Board of Supervisors of Los Angeles County to install six CES 700 Ballot Multiplexer systems for the rapid transfer of votes from punch cards to magnetic tape.

MetPath, Inc. has been awarded a contract by Pharmacochemicals to process all administrative and medical reporting functions.

Teleprocessing Industries has received a \$1.5 million contract from TRT Telecommunications Corp. to design and install an

international message-switching processing system in TRT's Fort Lauderdale, Fla., technical operations center.

Control Data Corp. has been awarded a \$1.2 million contract by the U.S. Marine Corps to cover production of 19 AN/TYC-5A high-speed data communications terminals and associated logistics support.

Univac has received a contract from the Federal Aviation Administration for automation of FAA's Anchorage Air Route Traffic Control Center.

Information Displays, Inc. has been awarded a contract by Sperry Rand Corp. to build a 21-in. random position Situation Display to be incorporated into the Computer Aided Operations Research Facility of the Na-

POSITION ANNOUNCEMENTS

EXECUTIVE DIRECTOR OF THE COMPUTER NETWORK University of Nebraska System

The University of Nebraska seeks to fill a major administrative position at the University-wide System level. The Executive Director of the Computer Network is responsible for the entire range of computer activities in the University of Nebraska. Instructional, research and administrative computing services are provided by the Computer Network. The Executive Director should have experience in managing a large computer service organization, preferably in a major university. Familiarity with modern computing equipment and networking is essential. For further information, including a position description, contact William C. Erkins, Executive Vice President for Administration, University of Nebraska, 3835 Holdrege, Lincoln, Nebraska 68503. Inquiries will be received to July 15, 1974. The University of Nebraska is an Equal Opportunity/Affirmative Action Employer.

Director of University Computing Center

Be responsible for all aspects of university computing center activities:

- Take charge of Univac 1108 — IBM 370/145 installation.
- Aid academic community in instruction, research utilization.
- Supervise development, maintenance and operation of administrative services (finances, registration, payroll, etc.)
- Supervise software development and maintenance.
- Direct operations including equipment selection.
- Manage staff for all of the above activities.

Position requires proven competence, both managerial and technical, at large multi-user computing center; university experience desirable. Benefits include excellent pension and tuition remission plans. Send resume to:



Deputy Chancellor
NEW YORK UNIVERSITY
Elmer Bobst Library
70 Washington Square South
New York, N.Y. 10012.

Affirmative Action — Equal Opportunity Employer, E/F/M

Systems Programmers

The fastest growing utility in the Nation has immediate openings for Systems Programmers in the Technical and Software Support area.

The successful applicant will be required to have a degree in Computer Sciences or Math with a Statistical background and a minimum of three years of OS/MVT experience on an IBM System 360/65 or larger, of which at least six months has been with OS/VS2.

This experience must be in the areas of System Generation and tuning, OS Internals, JCL and TSO. Also, experience in IMS, CICS and evaluation and benchmarking of various peripherals and software products is desirable.

Qualified applicants who wish to be considered for this challenging position in one of the most progressive and innovative Utility installations should submit a resume including salary requirements to:

Mr. A. M. Strickland
Florida Power & Light Company
P.O. Box 913100
Miami, Florida 33101

Position Announcements

APPLICATIONS PROGRAMMING MANAGERS

Positions available for individuals with strong technical knowledge of applications on IBM OS hardware and software. These positions require a background in corporate financial systems or hospital systems and applications as well as excellent communication skills. Responsibilities will include long range systems planning and supervision of 10-15 analysts and computer programmers for applications projects.

Please send resume including salary history to:

STANFORD UNIVERSITY

Personnel & Employee Relations
Dept. CW 346
Stanford, California 94305
Equal Opportunity Through
Affirmative Action Employer

**COMPUTER
PROFESSIONALS**

Our client, a noted, expanding New York State firm, has immediate openings for the following personnel:

Systems Specialist 19K
2-3 yrs. major mfg. systems exp. with excellent communication skills. BS/MS preferred.

Systems Programmer 13K
2-3 yrs. exp. in mfg. systems. Must have responsibility for generating and maintaining time communication systems. 1-3 yrs. 370/DCS exp.

Systems/Analyst 18K
1-2 yrs. exp. in advanced project leader. 1-2 yrs. gen. and financial sys. systems with good programming background.

Programmer 12K-13K
One year of this program. Must be qualified for this new position. If your first position is a training position, this could be the Co.-you want.

Send resume or call:

Career Advisors

125 West Road—Albany, N.Y. 12205

(518) 458-1810

Our client companies assume all fees.

FPL

FLORIDA POWER & LIGHT COMPANY

An Equal Opportunity Employer M/F

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

機会 JAPAN

PROGRAMMER/ANALYSTS (2)

(PERMANENT ASSIGNMENT-JAPAN)

U.S. Fortune 500 consumer packaged goods leader is establishing progressive and challenging worldwide data processing, standardization, and communication program.

We require 2 programmer/analysts with 2-4 years COBOL programming, preferably in a manufacturing environment. Experience with IBM 360/370 equipment, DOS or OS required, and familiarity with CICS, D BOMP, and assembly language desirable.

Successful applicants must be willing to relocate to the United Kingdom (Wales) for 12-18 months prior to permanent assignment with wholly-owned company in Japan, in addition to fluency in English, the ability to speak, read, and write Japanese is mandatory.

Please forward complete resume including present compensation in complete confidence to:

CW Box 4158

787 Washington Street, Newton, Mass. 02160

An equal opportunity employer, m/f

Programmer Analyst

Pharmaceutical Research

As our research efforts continue to expand, we offer an opportunity to participate in systems design/implementation and programming as a member of a group important to the success of an intensive medical research effort.

The appointment requires 3 years or more of experience handling large volumes of data PLUS knowledge of COBOL, or PL/I and OS/JCL. A degree in computer science or the biological or physical sciences will be an asset.

The position offers attractive benefits, is located adjacent to the Garden State Parkway, and has easy access by public transportation to all parts of the metropolitan area.

Please send resume including present salary information to: Manager of Research Employment.

Shering Corporation
80 Orange Street
Bloomfield, N.J. 07003



SHERING CORPORATION

Applicants of all races are encouraged to apply. - EEOE/M/F

computer professionals ask any edp manager which personnel agencies he prefers.

Most of them will tell you that they prefer to work with ESP Associates Agencies, the top professionals specializing in the field. And these managers prove it every day. They give us far more computer career opportunities than you could find elsewhere.

So, whether you want to advance your computer career in your own city... or to relocate... simply contact our offices nearest to you. We'll show you a whole new world of career opportunities!

esp associates

CLEVELAND
McCombs & Associates, Inc.
201 Buckeye Avenue
Cleveland, Ohio 44114

DALLAS
Data Processing Careers
Suite 1108
Summit Tower West
Dallas, Texas 75201

DETROIT
Electronic Systems Personnel
1765 Fisher Building
Detroit, Michigan 48202

HARTFORD
Comet, Inc.
500 Asylum Avenue
Hartford, Connecticut 06108

KANSAS CITY
Electronic Systems Personnel
215 West 10th Street
Kansas City, Missouri 64105

LOS ANGELES
Career Data Personnel Agency
Suite 322
2502 Wilshire Boulevard
Los Angeles, California 90010

MILWAUKEE
EDP Consultants
11430 W. Bluemound Road
Westbrook, Wisconsin 53095

MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
201 Nicollet Mall, Suite 1718
Minneapolis, Minnesota 55402

PITTSBURGH
Electronic Systems Personnel
108 Leavens Building
426 Forbes Avenue
Pittsburgh, Pennsylvania 15219

SAN FRANCISCO
The Computer Resources Group
303 Sacramento Street
San Francisco, California 94111

ST. LOUIS
Comet & Long
7777 Glenhurst, Suite 1801
St. Louis, Missouri 63105

WASHINGTON, D. C.
Electronic Systems Personnel
Suite 104
1000 Wisconsin Ave., N.W.
Washington, D. C. 20036

SALES PROFESSIONALS

Data Entry Systems National Openings

A Piece of the Action

Account thru Branch Manager Openings

If you're aggressive, and you've got a successful track record in sales, this is your chance to take part in our growth.

Entrex, Inc., a leading manufacturer of data entry systems, is increasing its sales force to accommodate increasing market demand. Right now, we're offering proven sales professionals a piece of the action in these areas. Philadelphia, Indianapolis, Los Angeles, Atlanta, Chicago, San Francisco New York City and other major cities.

To qualify, you'll need a minimum of 3 years of direct sales experience in computer systems and peripherals.

Successful candidates will have had formal professional sales training and will be fully capable of demonstrating the technical aspects of data entry systems and will be able to provide consultative services to prospective clients.

First year's earning potential in excess of \$30,000.

Please forward resume including current salary history to:

Lou Savoie

Entrex

168 Middlesex Turnpike
Burlington, Mass. 01803
(617) 273-0480

An Equal Opportunity Employer

INTEGRATED SYSTEMS SUPPORT INCORPORATED

BEAT INFLATION IN
LOW COST AREA OF
VIRGINIA BEACH, VA.

Integrated Systems Support, Inc. (ISSI) is significantly increasing its professional programming staff in Virginia Beach, Va. and has three new contracts with many challenging positions for real-time command and control programmers. So if you want a chance to develop in an expanding organization, this is your spot. While a degree is preferred, a premium is placed on relevant work experience.

We are specifically looking for experience in:

- *Command & Control Systems
- *Software Development
- *Real-Time Programming
- *CS-1, CMS-2 Programming
- *Multi-Processing System

Experience in the following computers is desirable:

- *UNIVAC CP-642 A/B, 1230 AN/JYK-7
- *UNIVAC 901/1530/1532-A
- *Texas Instruments CP-967/JYK

For consideration, please send resume in confidence to:

JOHN CROWLEY

INTEGRATED SYSTEMS SUPPORT, INC.

3330 Pacific Avenue
Virginia Beach, Va. 23451

An Equal Opportunity Employer

SUBSIDIARY OF:

SYSTEM
DEVELOPMENT
CORPORATION

POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS																						
<p>DIRECTOR OF COMPUTER SERVICES BERKSHIRE COMMUNITY COLLEGE</p> <p>Berkshire Community College, a two-year regional community college of 1450 students, is seeking a Director of Computer Services. Responsibilities include: supervising computer services to college administrative offices, academic departments including Business Data Processing discipline, and faculty-wide regional time-sharing project. Graduate degree preferred in computer-related discipline; minimum three years experience in computer-related field. Academic setting requires knowledge of BASIC, COBOL, FORTRAN, data-base management. Salary range commensurate with experience.</p> <p>Applications deadline July 15. Send resume to Dean Kendall Wey, Berkshire Community College, West Street, Pittsfield, Massachusetts, 01201.</p> <p>Berkshire Community College is an Affirmative Action/Equal Opportunity Employer. Identifiable minority applications are encouraged.</p>	<p>SYSTEMS ENGINEER</p> <p>Requires two to three years experience in performance evaluation and optimization of computer systems; evaluation of system software and application software packages; and conducting feasibility studies for the enhancement of hardware and software. This large organization offers liberal benefits with a starting salary of approximately 13K per annum; depending upon your experience and qualifications.</p> <p>Send your resume to S.E.G. Division of Automated Data Processing 8th St. Office Bldg. Richmond, Va. AN EQUAL OPPORTUNITY EMPLOYER</p>	<p>Right Guard Tame Max Purrr</p> <p>Professional growth. Challenging assignments. Educational development. Excellent Salary. Unmatched benefits. An excellent opportunity to make a significant contribution.</p>	<p>ACCOUNT EXECUTIVE SENIOR SYSTEMS ANALYST</p> <p>A newly created division of R.G. Barry, Corp. designed to introduce the full range of EDP Services to the Central Ohio business community is looking for EOP professionals.</p> <p>Account Executive must have at least 5 years in EDP and 3 years in selling. Will be selling and working with clients on data processing systems and systems development.</p> <p>Senior Systems Analyst must be able to lead a systems and programming project team in the development of commercial applications using COBOL in a 370 DCS installation. Must have 7 years in EDP (including 2 years programming, 3 years as systems analyst/programmer, and 1 year as a project leader or a systems supervisor.</p> <p>Please send salary requirements and resume in confidence to:</p> <p> Randy Martin INFORMATION SYSTEMS SERVICE Division of R.G. Barry Corporation 78 E. Chestnut St. Columbus, Ohio 43215 An Equal Opportunity Employer M/F</p>	<p>Data Processing Supervisor Planning and Development</p> <p>This new position will function as the technical advisor to the Data Processing Division of the Milwaukee Public School System and will plan for the Division's future hardware, software, and major application requirements, including the development and maintenance of a long-range operating plan. Requires a college degree and three years experience in computer systems analysis, consulting work or computer programming. Salary: \$15,142 to \$22,415 with attractive fringe benefits. Write or call:</p> <p>CITY OF MILWAUKEE Personnel Department 200 E. Wells Street Milwaukee, Wis. 53202 (414) 276-3376</p>	<p>Systems and Programming Analysts: Give your MIS career the personal care that only Gillette can offer.</p>																					
<p>INFORMATION SYSTEMS EXECUTIVE</p> <p>This newly created position will report directly to the Senior Vice President and will be responsible for planning and directing our data processing activities, with a budget in excess of one million dollars. We are located in a small attractive community. Travel requirements are minimal. Salary is open from \$25,000. You must have a bachelor's degree, proven executive experience, and an appreciation of technical EDP matters. Experience in financial services will be helpful. Send resume and salary history in confidence to:</p> <p>QW Box 4160 797 Washington St. Newton, Mass. 02160</p>	<p>SYSTEMS ANALYST</p> <p>Rapidly expanding, mid-Atlantic, bank holding company seeks SYSTEMS ANALYSTS experienced in banking applications to work with Leading Edge System Design projects on IBM 370 equipment. Enjoy the challenge of growth and the quality of life in an ocean front, resort community that is part of a large metropolitan area. Excellent benefits and salary package.</p> <p>AN EQUAL OPPORTUNITY EMPLOYER</p> <p>CW Box 4161 797 Washington Street Newton, Mass. 02160</p>	<p>Trac II Foamy Adorn Flair Toni Buxton Braun Cricket Right Guard Tame Max Purr Trac II Foamy Adorn Flair Toni Buxton Braun Cricket Right Guard</p> <p>Gillette Corporate MIS is taking off. We've consolidated divisional operations and moved them to Boston from Chicago. Due to this reorganization and expansion there are many genuine opportunities for MIS professionals to get in on the ground floor of a dynamic data processing group. And to participate in the growth of the country's leading manufacturer of personal care products.</p> <p>Gillette MIS needs systems and programming analysts at all levels. People who are accustomed to working in a large OS environment on a variety of commercial applications. Successful candidates will work with an IBM 370/158 running under OS/MVT, including on-line, time sharing and remote job entry. Future MIS plans call for significant development, including multi-processor, data base, virtual systems, OCR, CDM, etc. We need professionals with advanced expertise in designing and installing complex systems utilizing state-of-the-art design philosophies.</p> <p>If you're interested in a Gillette MIS career, send your resume and salary requirements to Mr. A. Troid, The Gillette Company, Prudential Tower, Boston, Mass. 02199. Gillette is an equal opportunity employer M/F.</p>																								
<p>SR. SYSTEMS ANALYSTS for Management Information Systems</p> <p>This could be the opportunity you've been looking for... interesting assignments with a strong, dynamic company. EDP with two 370/158 computers under OS/MVT environment. Operations include data collection and real-time systems using IMS-V2 to access information data bases. Immediate openings for:</p> <p>MANUFACTURING OPERATIONS AREAS</p> <ul style="list-style-type: none"> Production Control: On line Materials Requirement Planning (MRP) Shop Scheduling and Loading Engineering Information Systems <p>FINANCIAL/MARKETING/ADMINISTRATIVE AREAS</p> <ul style="list-style-type: none"> Financial Control, Accounting, Marketing Contracts Administration, Business Planning, Personnel Computer Oriented - Order Processing (CO-OP) 	<p>MANAGEMENT RECRUITERS OF ANN ARBOR</p> <table border="1"> <tbody> <tr> <td>Programmer OS/DOS</td> <td>114K</td> </tr> <tr> <td>Prog./Analyst</td> <td>120K</td> </tr> <tr> <td>COBOL, Mfg. Bank, Serv.</td> <td>125K</td> </tr> <tr> <td>St. Analyst, ASB, H&S</td> <td>130K</td> </tr> <tr> <td>Micro-Programmer</td> <td>20K</td> </tr> <tr> <td>Computer/OS Software</td> <td>20K</td> </tr> <tr> <td>Complex/OS Software</td> <td>20K</td> </tr> <tr> <td>Computer Tech writers</td> <td>15K</td> </tr> <tr> <td>Staff Data Mgrs</td> <td>25K</td> </tr> <tr> <td>NC Programmers</td> <td>20K</td> </tr> <tr> <td>Yach. Buyer, Electronic components</td> <td>20K</td> </tr> <tr> <td>Sales or Sales Mgrs</td> <td>15-28K</td> </tr> </tbody> </table> <p>ALL FEE PAID Send Salary History to Scott J. Hild 2128 Plymouth Rd. #202 Ann Arbor, Mich. 48106 (313) 769-1725 Most of the jobs in S.E. Michigan</p>	Programmer OS/DOS	114K	Prog./Analyst	120K	COBOL, Mfg. Bank, Serv.	125K	St. Analyst, ASB, H&S	130K	Micro-Programmer	20K	Computer/OS Software	20K	Complex/OS Software	20K	Computer Tech writers	15K	Staff Data Mgrs	25K	NC Programmers	20K	Yach. Buyer, Electronic components	20K	Sales or Sales Mgrs	15-28K	<p> The Gillette Company</p> <p>We'll be interviewing in your area very shortly.</p>
Programmer OS/DOS	114K																									
Prog./Analyst	120K																									
COBOL, Mfg. Bank, Serv.	125K																									
St. Analyst, ASB, H&S	130K																									
Micro-Programmer	20K																									
Computer/OS Software	20K																									
Complex/OS Software	20K																									
Computer Tech writers	15K																									
Staff Data Mgrs	25K																									
NC Programmers	20K																									
Yach. Buyer, Electronic components	20K																									
Sales or Sales Mgrs	15-28K																									
<p>TO ARRANGE AN INTERVIEW, please forward your resume stating present salary, to Mr. S.S. Bilanchone, Professional Placement, Hamilton Standard, Windsor Locks, Conn. 06096 - or call collect at (203) 623-1621, ext. 8601.</p> <p><i>An Equal Opportunity Employer M/F</i></p> <p>Hamilton Standard</p>	<p>YOUR RESUME</p> <p>Write it yourself INSTRUCTIONS SAMPLES FORMS: \$4 Resume Company Dept. DP 359 Jersey Ave. Fairview, N.J. 07022</p>																									

POSITION ANNOUNCEMENTS POSITION ANNOUNCEMENTS POSITION ANNOUNCEMENTS POSITION ANNOUNCEMENTS POSITION ANNOUNCEMENTS POSITION ANNOUNCEMENTS POSITION ANNOUNCEMENTS

Equipment Leasing Brokers

We are looking for Brokers to expand our equipment leasing program throughout the U.S.A. we pay top fees at closing. Prompt service, write or call collect.

Joseph A. Guccione, President
 Detric Service Corporation
 5216 Wesley Terrace
 Rosemont, Ill. 60018
 (312) 992-0760

PROGRAMMER/ANALYST

BOSTON COLLEGE

Our Computer Center seeks a Programmer/Analyst skilled in PL/I and one other language - preferably COBOL - along with the interpersonal communication skills to handle systems applications. Requires knowledge of IBM Job Control Language and Utilitas for JCL. Must have Teletyping experience and an undisturbed position to the expected benefits, we provide free undergraduate tuition in our excellent program. Center based on graduate tuition and the congenial atmosphere of a scenic campus.

SOFTWARE
OUTSTANDING SALES OPPORTUNITY

The leading producer of Corporate Financial Reporting Systems needs successful salesmen to expand their business. Hands-on/Software sales experience a necessity. This is an unusual opportunity to sell the World's No. 1 General Ledger and other Financial Reporting Systems. Send Resume to R.P. Paine, V.P. Marketing, Outwelling Inc.

NEW YORK LOS ANGELES HOUSTON

SOFTWARE INTERNATIONAL

Elm Square, Andover, Mass. 01810 (617) 476-5040

Cummins Engine Company, the nation's largest independent manufacturer of diesel engines has the following immediate openings:

SCIENTIFIC ANALYST -SYSTEMS:

Will aid in set up and implementation of improvements and new releases of operating system. Will write special purpose software and aid in fixing system related problems. Prefer B.S. in engineering or computer science with 1-2 years programming experience. Should be proficient in FORTRAN and ASSEMBLER language.

SCIENTIFIC ANALYST APPLICATIONS:

Will design systems and write applications programs for customers in a wide variety of discipline (Engineering, Finance, or Marketing). Also, aid in conversion of programs from outside computer services to in-house equipment. Prefer B.S. in Engineering or Computer Science with 1-2 years programming experience. Should be proficient in Fortran, knowledge of BASIC, COBOL and experience with Time Sharing Systems would be desirable.

Current hardware is a 112 K Xerox Signi 6 with 32 Time Sharing lines running the CP-V Operating System soon to be replaced with a 128K Xerox Signi 8.

Cummins has global operations and has doubled its sales in the last five years. We are headquartered in a progressive midwestern town with superior schools and a relaxed life-style. The Company provides excellent fringe benefits and competitive salaries. Send resume and salary requirements to: F.J. Loughrey, Cummins Engine Company, 1000 Fifth Street, Columbus, Indiana 47201.

Cummins

Cummins Engine Company, Inc., Columbus, Indiana 47201
 An Equal Opportunity Employer

Faculty Positions in Computer Science

The department is seeking candidates for positions at the level of instructor and assistant professor. We are interested in candidates with a Ph.D. in computer science and an interest in computability theory, logic, and data organization. Industrial research experience is highly desirable. The candidate for the instructor position will have a M.S. in computer science and will have completed some of the following courses: CSC 301, CSC 302, CSC 303, CSC 304, CSC 305, CSC 306, CSC 307, CSC 308, CSC 309, CSC 310, CSC 311, CSC 312, CSC 313, CSC 314, CSC 315, CSC 316, CSC 317, CSC 318, CSC 319, CSC 320, CSC 321, CSC 322, CSC 323, CSC 324, CSC 325, CSC 326, CSC 327, CSC 328, CSC 329, CSC 330, CSC 331, CSC 332, CSC 333, CSC 334, CSC 335, CSC 336, CSC 337, CSC 338, CSC 339, CSC 340, CSC 341, CSC 342, CSC 343, CSC 344, CSC 345, CSC 346, CSC 347, CSC 348, CSC 349, CSC 350, CSC 351, CSC 352, CSC 353, CSC 354, CSC 355, CSC 356, CSC 357, CSC 358, CSC 359, CSC 360, CSC 361, CSC 362, CSC 363, CSC 364, CSC 365, CSC 366, CSC 367, CSC 368, CSC 369, CSC 370, CSC 371, CSC 372, CSC 373, CSC 374, CSC 375, CSC 376, CSC 377, CSC 378, CSC 379, CSC 380, CSC 381, CSC 382, CSC 383, CSC 384, CSC 385, CSC 386, CSC 387, CSC 388, CSC 389, CSC 390, CSC 391, CSC 392, CSC 393, CSC 394, CSC 395, CSC 396, CSC 397, CSC 398, CSC 399, CSC 400, CSC 401, CSC 402, CSC 403, CSC 404, CSC 405, CSC 406, CSC 407, CSC 408, CSC 409, CSC 410, CSC 411, CSC 412, CSC 413, CSC 414, CSC 415, CSC 416, CSC 417, CSC 418, CSC 419, CSC 420, CSC 421, CSC 422, CSC 423, CSC 424, CSC 425, CSC 426, CSC 427, CSC 428, CSC 429, CSC 430, CSC 431, CSC 432, CSC 433, CSC 434, CSC 435, CSC 436, CSC 437, CSC 438, CSC 439, CSC 440, CSC 441, CSC 442, CSC 443, CSC 444, CSC 445, CSC 446, CSC 447, CSC 448, CSC 449, CSC 450, CSC 451, CSC 452, CSC 453, CSC 454, CSC 455, CSC 456, CSC 457, CSC 458, CSC 459, CSC 460, CSC 461, CSC 462, CSC 463, CSC 464, CSC 465, CSC 466, CSC 467, CSC 468, CSC 469, CSC 470, CSC 471, CSC 472, CSC 473, CSC 474, CSC 475, CSC 476, CSC 477, CSC 478, CSC 479, CSC 480, CSC 481, CSC 482, CSC 483, CSC 484, CSC 485, CSC 486, CSC 487, CSC 488, CSC 489, CSC 490, CSC 491, CSC 492, CSC 493, CSC 494, CSC 495, CSC 496, CSC 497, CSC 498, CSC 499, CSC 500, CSC 501, CSC 502, CSC 503, CSC 504, CSC 505, CSC 506, CSC 507, CSC 508, CSC 509, CSC 510, CSC 511, CSC 512, CSC 513, CSC 514, CSC 515, CSC 516, CSC 517, CSC 518, CSC 519, CSC 520, CSC 521, CSC 522, CSC 523, CSC 524, CSC 525, CSC 526, CSC 527, CSC 528, CSC 529, CSC 530, CSC 531, CSC 532, CSC 533, CSC 534, CSC 535, CSC 536, CSC 537, CSC 538, CSC 539, CSC 540, CSC 541, CSC 542, CSC 543, CSC 544, CSC 545, CSC 546, CSC 547, CSC 548, CSC 549, CSC 550, CSC 551, CSC 552, CSC 553, CSC 554, CSC 555, CSC 556, CSC 557, CSC 558, CSC 559, CSC 560, CSC 561, CSC 562, CSC 563, CSC 564, CSC 565, CSC 566, CSC 567, CSC 568, CSC 569, CSC 570, CSC 571, CSC 572, CSC 573, CSC 574, CSC 575, CSC 576, CSC 577, CSC 578, CSC 579, CSC 580, CSC 581, CSC 582, CSC 583, CSC 584, CSC 585, CSC 586, CSC 587, CSC 588, CSC 589, CSC 590, CSC 591, CSC 592, CSC 593, CSC 594, CSC 595, CSC 596, CSC 597, CSC 598, CSC 599, CSC 600, CSC 601, CSC 602, CSC 603, CSC 604, CSC 605, CSC 606, CSC 607, CSC 608, CSC 609, CSC 610, CSC 611, CSC 612, CSC 613, CSC 614, CSC 615, CSC 616, CSC 617, CSC 618, CSC 619, CSC 620, CSC 621, CSC 622, CSC 623, CSC 624, CSC 625, CSC 626, CSC 627, CSC 628, CSC 629, CSC 630, CSC 631, CSC 632, CSC 633, CSC 634, CSC 635, CSC 636, CSC 637, CSC 638, CSC 639, CSC 640, CSC 641, CSC 642, CSC 643, CSC 644, CSC 645, CSC 646, CSC 647, CSC 648, CSC 649, CSC 650, CSC 651, CSC 652, CSC 653, CSC 654, CSC 655, CSC 656, CSC 657, CSC 658, CSC 659, CSC 660, CSC 661, CSC 662, CSC 663, CSC 664, CSC 665, CSC 666, CSC 667, CSC 668, CSC 669, CSC 670, CSC 671, CSC 672, CSC 673, CSC 674, CSC 675, CSC 676, CSC 677, CSC 678, CSC 679, CSC 680, CSC 681, CSC 682, CSC 683, CSC 684, CSC 685, CSC 686, CSC 687, CSC 688, CSC 689, CSC 690, CSC 691, CSC 692, CSC 693, CSC 694, CSC 695, CSC 696, CSC 697, CSC 698, CSC 699, CSC 700, CSC 701, CSC 702, CSC 703, CSC 704, CSC 705, CSC 706, CSC 707, CSC 708, CSC 709, CSC 710, CSC 711, CSC 712, CSC 713, CSC 714, CSC 715, CSC 716, CSC 717, CSC 718, CSC 719, CSC 720, CSC 721, CSC 722, CSC 723, CSC 724, CSC 725, CSC 726, CSC 727, CSC 728, CSC 729, CSC 730, CSC 731, CSC 732, CSC 733, CSC 734, CSC 735, CSC 736, CSC 737, CSC 738, CSC 739, CSC 740, CSC 741, CSC 742, CSC 743, CSC 744, CSC 745, CSC 746, CSC 747, CSC 748, CSC 749, CSC 750, CSC 751, CSC 752, CSC 753, CSC 754, CSC 755, CSC 756, CSC 757, CSC 758, CSC 759, CSC 760, CSC 761, CSC 762, CSC 763, CSC 764, CSC 765, CSC 766, CSC 767, CSC 768, CSC 769, CSC 770, CSC 771, CSC 772, CSC 773, CSC 774, CSC 775, CSC 776, CSC 777, CSC 778, CSC 779, CSC 780, CSC 781, CSC 782, CSC 783, CSC 784,

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP									
FOR SALE OR LEASE RECERTIFIED-GUARANTEED DISK PACKS <table border="1"> <tr> <th>sale price</th> <th>lease price</th> </tr> <tr> <td>2316-2314</td> <td>\$147.50</td> </tr> <tr> <td>1316-2311</td> <td>55.00</td> </tr> <tr> <td>1130-2315</td> <td>55.00</td> </tr> </table> MAG. TAPES 1600 BPI-2400 reels \$5.50 .95 800 BPI-2400 reels 4.50 .75 556 BPI-2400 reels 4.50 .50 Also available, cassettes & reels, \$1.00 CALL OR WRITE TO: Ken Bunger - (503) 232-7069 AUTOMATED SYSTEMS ACCESSORIES INC. 1637 S.E. Hawthorne Blvd. Portland, Ore. 97214	sale price	lease price	2316-2314	\$147.50	1316-2311	55.00	1130-2315	55.00	SELL OR LEASE RCA 70/590-8 Disk System  7670 Chippewa Road Breckville, Ohio 44141 (216) 526-2080 A Division of D&D Financial Enterprises Inc.	don't LEASE! UNTIL YOU FIND OUT WHY LEASING FROM THE FULL-SERVICE COMPANY IS DIFFERENT... AVAILABLE IMMEDIATELY: 360/40 WITH I/O SET 360/65 WITH I/O SET UNIVAC 1004 CALL TERRY ELIAS AT (312) 676-5511 OR WRT 11-10  COMPUTER SERVICE CORPORATION 800 N. WILSON AVE. SUITE 200 CHICAGO, ILL. 60642 Equal Opportunity Employer M/F/H/V	360 Model 40 AVAILABLE FOR IMMEDIATE LEASE Any core size, CPU only or complete system including I/O set For an immediate quote call Sid Whiting, Director of Computer Marketing (617) 266-4950 Bankers Leasing Corporation 1255 Boylston Street Boston, Mass. 02215 Subsidiary of Southern Pacific Company	Available for short-term lease 2-370/135's loaded or to suit 1-370/155 any capacity Principals apply only CW Box 4138 797 Washington St. Newtonville, Mass. 02160	
sale price	lease price												
2316-2314	\$147.50												
1316-2311	55.00												
1130-2315	55.00												
FOR SALE OR LEASE 360/30 1401  Corporate Computers, Inc. 115 Meison St. Overland Center, 58430 (203) 661-1500 Member Computer Dealers Assoc.	FOR SALE IBM 2311 disks (qty. 3) IBM 2841 disk control Available September 1 IBM Maintenance #18 North Michigan Avenue Chicago Illinois 60611 Telephone: (312) 933-3776 Telex: 255 543 Member - Computer Dealers Assoc.	CROSS buys, sells and leases all  360/20, 30, 40, 50 and 65's 370/135's, 145's and 155's SYSTEM/3 UNIT RECORD EQUIPMENT ALL PERIPHERAL DEVICES LEASE FINANCING AVAILABLE (312) 461-9832  CROSS COMPUTERS CORPORATION 1000 N. WILSON AVE. SUITE 200 CHICAGO, ILL. 60642 MEMBER COMPUTER DEALERS ASSOCIATION	COMPUTERS FOR MORE INFORMATION ON THE COMPUTER/SOUTH NETWORK. A new concept in the buying and selling of used computers, please write or call: t. Litchfield ASSOCIATES P.O. Box 48361 Atlanta, Georgia 30329 404/321-0263	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											
WANTED 360/40-256K 2 Channels and 1052 Console	MUST HAVE Decimal Arithmetic Floating Point Storage Protect Interval Timer 2803 - 2 IBM Tape Control 2401 - 4, 5 IBM Dual Density Tape Drivers, (4) Principles only please CW Box 4142 797 Washington St. Newton, Mass. 02160	FOR SALE OR LEASE 65K 1.5u MODEL 30 SYSTEM Complete with I/O Set Disk and Tape Contact G. Paradowski M.W. Karch Co. P.O. Box 2040 Milwaukee, WI 53012 (414) 242-5000	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											
FOR SALE CPUS, PERIPHERALS, MEMORY IBM 360 HON 200/2000 UNIVAC 9000 418 1108-II MINICOMPUTERS (617) 261-1100 AMERICAN USED COMPUTER CORPORATION P.O. Box 68, Kenmore Station, Boston, MA 02215 Member Computer Dealers Association	360/40 SYSTEMS FOR LEASE F thru H CPU Hi-Speed I/O 2314 DISK Tapes, etc. 360/20 16K, 2 Disk Card I/O, Printer	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											
FOR SALE CPUS, PERIPHERALS, MEMORY IBM 360 HON 200/2000 UNIVAC 9000 418 1108-II MINICOMPUTERS (617) 261-1100 AMERICAN USED COMPUTER CORPORATION P.O. Box 68, Kenmore Station, Boston, MA 02215 Member Computer Dealers Association	360/40 SYSTEMS FOR LEASE F thru H CPU Hi-Speed I/O 2314 DISK Tapes, etc. 360/20 16K, 2 Disk Card I/O, Printer	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											
FOR SALE CPUS, PERIPHERALS, MEMORY IBM 360 HON 200/2000 UNIVAC 9000 418 1108-II MINICOMPUTERS (617) 261-1100 AMERICAN USED COMPUTER CORPORATION P.O. Box 68, Kenmore Station, Boston, MA 02215 Member Computer Dealers Association	360/40 SYSTEMS FOR LEASE F thru H CPU Hi-Speed I/O 2314 DISK Tapes, etc. 360/20 16K, 2 Disk Card I/O, Printer	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											
FOR SALE CPUS, PERIPHERALS, MEMORY IBM 360 HON 200/2000 UNIVAC 9000 418 1108-II MINICOMPUTERS (617) 261-1100 AMERICAN USED COMPUTER CORPORATION P.O. Box 68, Kenmore Station, Boston, MA 02215 Member Computer Dealers Association	360/40 SYSTEMS FOR LEASE F thru H CPU Hi-Speed I/O 2314 DISK Tapes, etc. 360/20 16K, 2 Disk Card I/O, Printer	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											
FOR SALE CPUS, PERIPHERALS, MEMORY IBM 360 HON 200/2000 UNIVAC 9000 418 1108-II MINICOMPUTERS (617) 261-1100 AMERICAN USED COMPUTER CORPORATION P.O. Box 68, Kenmore Station, Boston, MA 02215 Member Computer Dealers Association	360/40 SYSTEMS FOR LEASE F thru H CPU Hi-Speed I/O 2314 DISK Tapes, etc. 360/20 16K, 2 Disk Card I/O, Printer	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	FOR SALE XEROX SIGMA 5 40K WITH COMMUNICATIONS CONTROLLER 213/597-6655 X 2249 Data Processing Dept. Long Beach Community Hospital 1725 Terminal Avenue Long Beach, Calif. 90804	IBM 155-J by Owner 5 Selector Channels 3215 Console (2) 3360-3 Meg. Core IMMEDIATE DELIVERY <table border="1"> <tr> <th>Sale Price</th> <th>Term Sale</th> <th>Lease</th> </tr> <tr> <td>\$850,000</td> <td>\$17,900 (60 mo)</td> <td>\$15,500 (60 mo)</td> </tr> <tr> <td></td> <td></td> <td>\$19,000 (36 mo)</td> </tr> </table>  THOMAS COMPUTER CORPORATION 400 N. CLARK, COURT SUITE 200 CHICAGO, ILLINOIS 60610 (312) 944-9401	Sale Price	Term Sale	Lease	\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)			\$19,000 (36 mo)
Sale Price	Term Sale	Lease											
\$850,000	\$17,900 (60 mo)	\$15,500 (60 mo)											
		\$19,000 (36 mo)											

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

We Need:
1419
2314
MOD A-1

**BUY
SELL
LEASE**

Available:
360/40
2314 — MOD I
2 channel switch

**FOR
BETTER
VALUE
LOOK TO:**

cac

COMPUTER ACQUISITIONS COMPANY
P.O. Box 80372 Atlanta, Ga. 30341 (404) 522-4425

LEASE BUY SELL
LEASE OFFERED FOR SALE AND LEASE

360/370

COMPUTER WHOLESALE CORP.

SYSTEM 360/370 | **dearborn**

A business relationship you can't afford to be without...

- Lease Terms to Fit Your Needs • Field Engineering Support
- Systems Engineering Support • Well Trained Marketing Staff

- Buy and Sell 360s • Subleasing

Member, Computer Leasing Association
Dearborn Computer Leasing Corporation
A subsidiary of Dearborn-Storm
4849 North Scott Street / Schiller Park, Illinois 60175 Area 312/571-4410

**360/65
FOR SALE OR LEASE
370/155 WANTED**

360/65 for sale or lease. Available with IBM or OEM memory, any number of selector channels. Available with 7094, 7080, or 7074 compatibility. Also available on month-to-month basis.

2365-2's available for sale, lease, or month-to-month lease.

370/155 wanted to purchase, for early delivery. Will consider any specifications, the larger the better. Will buy with IBM or OEM memory.

**IPS COMPUTER
MARKETING CORP.**
467 Sylvan Avenue,
Englewood Cliffs,
New Jersey 07632
(201) 871-4200,
TWX (710) 991 9677
"MEMBER COMPUTER DEALERS ASSOCIATION"

IPS

**360-370
market place**

BUY SELL LEASE

**TLW COMPUTER
INDUSTRIES INC.**

ATLANTA: 3870 American Drive, Atlanta, Ga. 30341
404-481-1808 TWX 910-797-3634
CHICAGO: 312-293-2030
SAN FRANCISCO: 408-343-0110
LOS ANGELES: 213-373-6825

**OPEN TO BUY
MINIS**

DECHONEYWELL
Data General
HP-SEL-IBM
Varian Interdata
etc...

Available Cash
Large Lots Preferred
(617) 261-1100

**AMERICAN USED
COMPUTER CORP.**

P.O. Box 68, Kenmore Station
Boston, Mass. 02215
TWX: 710-321-6388

Member
COMPUTER DEALERS
ASSOCIATION

**360 Model 30
AVAILABLE FOR
IMMEDIATE LEASE**

Any core size, CPU only or
complete system including I/O set

For an immediate quote call

Sid Whiting

Director of Computer Marketing

(617) 265-4050

Banking Leasing Corporation

1255 Boylston Street

Boston, Mass. 02215

Subsidiary of Southern

Pacific Company

BUY SELL SWAP

Warehouse
SALEComplete liquidation of
30,000 sq. ft. COK newWEEKLY SPECIAL—
#814 Disk Files
15 per box (includes
exceptional condition
\$10,000 ea. offer)Send for complete list
or any special requests
Ulberman Dist. Co.
849 University Ave.
St. Paul, Minn. 55106
(612) 466-3651FOR SALE
or
LEASE360-30
32KCORE UPDATE
32K to 64KCall or Write
Time Oil Co.
2737 W. Commodore Way
Seattle, WA 98199
(206) 285-2400

FOR LEASE BY OWNER

IBM 360/65 1 meg.
Available July 74
We currently have a
360/65 and are anxious
to lease.
We will pass on all bene-
fits to lessee.Call
(515) 284-2679

Negotiable

BUY SELL SWAP

FOR SALE
M. 451410FOR SALE
360/30F — #17743,
2 selector channels
August 1 Delivery
IBM Maintenance810 N. Michigan Avenue
Chicago, Ill. 60611
Phone: (312) 467-1111
Telex: 253535

360/20

Disk — Tape — Card
Buy — Sell — Trade — Lease
Specialists in Model 20
CMI Corporation
16225 E. Warren Ave.
Detroit, Michigan 48224
(313) 889-0440
Member Computer Dealers
AssociationFOR SALE
BY OWNER360/40
128K

—also—

2314-19 Drive with
2844 Control both with
2 channel switches.
Ideal disk configuration
for two CPU Shop
Available late July
Contact:
R.L. Walquist
VWR Scientific
3745 Bayshore Blvd.
Brisbane, Ca. 94005
(Phone) (415) 469-4345

BUY SELL SWAP

360/40 128K

loaded with features

1052

Serial # 22580

Priced for quick sale
Immediate deliverytbi
TBI Equipment Div.
Time Brokers, Inc.
800 Executive Blvd.
Evanston, Ill. 7, 10523
(914) 992-0089Nationalwide specialists of
DP equipment & computer time
Basis: Chicago, Lincoln & S. Cal. Offices
New York City, Washington, D.C. and San Francisco
Member Computer Dealers AssociationBUY • SELL
RECONDITIONNew or Used
TELETYPE
MACHINES
&
DATA COM
EQUIPMENTCall or write
(714) 252-7502
1-W-X 0-10 860 5761

FOR SALE

UNIVAC

80 Column 1001
1005-111 Tape
Univac 60 tape
subsystem Master & Slave

WE WANT TO BUY

UNIVAC

1004/1005

Contact M.A. Jarrett

MAINTech INC.

1133 Ave. of the Americas
New York, N.Y. 10036
(212) 586-2823

FOR SALE OR LEASE

IBM

1401 SYSTEMS

with or without
Tape Drives & Disks
Savings in thousands
Member
Computer Dealers Assoc.D.P. Equipment
Marketing Corp.
260 W. Broadway, N.Y. N.Y.
CALL (212) 925-7737 Ext. 1

360/20

Card-Disk-Tape Systems
30-60 Day Delivery

ECONOCOM, INC.

Subsidiary of Cook Industries, Inc.
355 Ridge Lake Blvd.
Memphis, Tenn. 38117
(901) 787-4126
MEMBER COMPUTER
DEALERS ASSOCIATION

BUY SELL SWAP

BEST USED IN THE COMPUTER MARKET

GOOD CUSTOMER RELATIONS

024	063	402	523
026	084	403	548
029	085	407	553
056	087	408	557
077	088	514	602
082	089	519	604

We Buy, Sell or Lease
360-20
System 3
1130LNC
Let's BuyNEW MAILING LIST
FOR SALE
100,000 names in 100,000 letters
100,000 names in 100,000 letters
100,000 names in 100,000 letters

360/65 WANTED

- 512K Storage
- 3 Selector Channels
- Multiplexer Channel
- Console

Delivery by Oct. 1, 1974

Member Computer Dealers Assoc.
LUNCEFORD & ASSOCIATES
19131 3817212
Village View Bank Bldg
Overland Park, Kan. 66212TELETYPE & FOUNDATION
TELETYPE & FOUNDATION

WE WILL PURCHASE

TELETYPE & FOUNDATION

FOR SALE LEASE TRADE

TELETYPE
Computers • Disk Files • 989 6580

buy lease 360/370 sell trade

- | | | |
|-------------|----------------------------|-------------------|
| CPUs | I/O | DISK/TAPE |
| • 360/25 | 1043 Printers | • 2314-4 Drives |
| • 16K | Models 2, 3 N1 | • 2311s |
| • 360/30 | • 2821 Controllers | • 2415-4 |
| • 256K | Models 1 & 2 | 1600 BPI |
| • 360/40 | | • 2804-2 CTRL |
| • 384K | | • 2402-2, 800 BPI |
| • System/2 | • 64K-360/40 Core | |
| A17 (64K) | • 32K Amps core for 360/30 | |

Call Collect. 612-546-4422

dataserv

equipment inc.

400 shepard plaza suite 415
minneapolis, mn 55426

Member, Computer Dealers Assoc.

BUY • SELL • LEASE • TRADE

Available Immediately
Processors360 Models 30, 40, 50, 65
All core sizes and features
370/155 370/158

Miscellaneous

2401 Tape Drives
2420-7, 320K8 Tape Drives
2701, 2702 Data Adapter Units
2361-Large Core Storage

New! 1401 SIMULATOR

SIM 14
NOW AVAILABLE FOR 360-50-65
USERS

- EXECUTES UNDER BOTH DOS & OS
- SUPPORTS 1401 UNIT RECORD, TAPE AND DISC DEVICES
- JCL AND FILE COMPATIBLE WITH CS30-40
- SELF RELOCATING FOR MULTIPLE PARTITION EXECUTION
- THROUGHPUT SPEEDS EQUAL TO CS40
- PROVEN PRODUCT BY CUSTOMER USE
- TAKE ADVANTAGE OF 360-50-65 LEASE PRICES WITHOUT HAVING TO REPROGRAM ANY 1401 PROGRAMS

SYSTEMS

2200 E. Devon Avenue
Des Plaines, Ill. 60018
(312) 827-8135




360/370

DATA
PROCESSING
EQUIPMENT
SPECIALISTS

SYSTEMS

DATA
PROCESSING
EQUIPMENT
SPECIALISTS

[illegible]

TIME FOR SALE	TIME FOR SALE	SOFTWARE FOR SALE	SOFTWARE FOR SALE	SOFTWARE FOR SALE
ILLINOIS IBM 360 370 USERS COMPUTER TIME AVAILABLE 370/158 2 mag, 3230 (32m), 2314 (8m), 32 3420-5 d.d. tape CHVSZ, RJE, TSO, ATC, DOS simul. 24 Hours - 7 Days 370/155 2 mag, 3230 (32m), 2314 (8m), 32 3420-5 d.d. tape 370/135 240K, 3230 (8m), 2314 (8m), 8 3420-5 d.d. tape 370/135 144K, 2314 (8m), 8 3420-5 d.d. tape 360/40 128K, 2314 (8m), 5 2401-2 tape 360/30 8K, 4 2311A, 5 2420-3 d.d. tape FOR FURTHER INFORMATION CALL FRANK ORLANDO (312) 346-1331  200 N. Michigan Avenue Chicago, Ill. 60601 Largest Computer Time Sales Co.	NEW YORK WE ARE BROKERS OF COMPUTER TIME IN THE NEW YORK AND NEW JERSEY METROPOLITAN AREA. Computer Reserve, Inc., Reserved Computer Time, Inc. (212) 541-8180 COMPUTER TIME ALL SYSTEMS Special 360/30 Midtown Location From \$25 per hour The Service Bureau that gives a dam!n ANCHOR SYSTEMS, INC. (516) 785-1788 (24 Hours) (212) 697-4660 I.B.M. - 360/30 All Shifts 65K, 4-2401 MOD-2, 3-2311, 1403-N1, 2540, 1401 Compatibility From \$35.00/Hour Restaurant Associates Int. 1540 Broadway bet. 45 & 46th St. New York, New York 10036 Contact: Al Palma at (212) 974-4965 Elliott Mushoff at (212) 974-4967	 ACCOUNTING SYSTEMS PAYROLL GENERAL LEDGER ACCOUNTS PAYABLE INVENTORY ACCOUNTS RECEIVABLE  QUERY3 English-Spang Language Written Multiple Reports Full Computation Capability Production and File Multiple Input File Option Tape Link-Up File Security Blank Screen User's Lib Runs on Most Computers ARX AZRHX INC. 215 Middle Turnpike Burlington, Mass. 01803 (617) 272-8760 HOSPITAL SOFTWARE PACKAGES Over 50 hospitals currently on the system. Written in ARX COBOL. Billing, inventory, diet, or fully documented and operational. • General Ledger - Financial Statements • Cost Allocation - Any basis • Trans Analysis - Unit Costing • Budget Forecasting and Modeling • Accounts Payable • Inventory Control • Patient Billing - Accounts Receivable • Admission-Discharge-Transfer • Payroll - Personnel • Nurse Scheduling • Unit Discharge • Fixed Asset - Preventive Maintenance • Professional Fee Billing HSA Hospital Personnel Services, Inc. 358 San Miguel Drive, Suite 282 Newport Beach, Calif. 92660 (714) 844-8411 or 120 East Ocean Avenue Hindustan, N.J. 08021	MEDICAL BILLING SYSTEM • Complete Insurance Forms • Profile, RVS, ICD-9 Files • Bal Forward, Ledger • All Cobot - DOS or OS • All Cobot - ALL LETTERS • Only \$600-30 day trial • PLS-Source Library Sys • Only \$1800 - 30 Day Trial also Payroll/Personnel • Only \$800-30 day trial Decentral Computer 11311 Camarillo Rd. No. Hollywood, Calif. 91602 (213) 765-1444 PAYROLL PERSONNEL ACCOUNTS PAYABLE X X X Modular, flexible systems with multi-company capabilities. Presently functioning for a variety of users. All programs written in COBOL. ARGONAUT INFORMATION SYSTEMS, INC. 2140 Springhill Ave. #202 Beverly Hills, CA 90212 (415) 845-7821 AUTOCODER & SPS TRANSLATED AUTOMATICALLY TO BAL & PL/1 THE TOTALIZATION SYSTEM ... The most economical, practical and quickest method of converting to the 3rd and 4th generation. 3 SERVICES OFFERED: 1. 1406 Object to clean source de-Compilation 2. 1400 Clean source to BAL translation 3. 1400 Clean source to PL/1 translation Contact: W. Small, President CPJ 10000 Wilshire Blvd., Suite 100 Los Angeles, CA 90024 (213) 477-1111	
MASSACHUSETTS COMPUTER TIME BROOKLINE 370/135 1st and 2nd Shift 96K DOS or DOS/VS Power 2 5-3330 1-2501 2-3420 1-1442 1-1403 \$50.00 per hour Contact: K. C. Coleman (617) 738-6410	NEW JERSEY I.B.M. - 360/30 All shifts available 65K, 5-2401 Mod-2 track 2-2401 Mod 2 track 4-2311, 1403-N1, 2540 Prices start at \$38.00 per hour. We also offer complete processing services. Configuration can be modified to accommodate any 360 computer user. We have on-site CE's. UCS Computer Centers Route 90 Dover, N.J. 07828 Contact Bill Kozay at (201) 381-8890 or Sam Andreone at (201) 381-8601	McCORMACK & DODGE CORPORATION HAS DEVELOPED MARKETING MAINTAINED Fixed Asset Analysis & Accounting System Accounts Receivable System Investment Analysis System Accounts Payable System McCORMACK & DODGE CORPORATION One Wells Avenue Newton, Mass. 02189 (617) 985-3760	MMS Accounts Payable-II Keeps The Well From Going Dry! Exclusive features: • Data base design - all COBOL • Complete vendor financial history • Cash commitments by date in detail and summary • Duplicate vendor invoice control • Flexible voucher/line control Other financial systems: Accounts Receivable General Ledger If you're the one with the problem of developing financial systems for your company, let us help you out. Instead of expensive and time consuming custom development, install an informational: • GENERAL LEDGER • ACCOUNTS PAYABLE • ACCOUNTS RECEIVABLE/ SALES ANALYSIS • FIXED ASSET Solving your FINANCIAL SYSTEMS problems is our business. INFORMATIONAL THE FINANCIAL SYSTEMS COMPANY Boston (617) 780-5042 Chicago (312) 332-6736 Dallas/Fort Worth (817) 32-6603 New York (212) 695-1600 9628 Conway Court San Diego, Ca. 92111 (714) 695-7970	
CONNECTICUT LOW RATES WITH TIME AVAILABLE NOW ON ALL SHIFTS 360/30 64K 2314-Disk Drives 800-BPI Tape Drives STAMFORD, CONN. MR. LONG (203) 327-0302	Software for Sale NCR CENTURY USERS Accounting Made Easy Location RELOCATED 211 1st Avenue North FARMINGDALE, N.Y. Contact: 333-3333 or 211 1st Avenue North FARMINGDALE, N.Y. Contact: 333-3333 MAKES THE DOS RELOCATABLE LIBRARY USABLE, EVEN FOR COBOL Catalogs any compiler output without using object decks, tape drives, or complex JCL \$99 CHANGE Manual: Needt Associates 2000 Madison Avenue, Suite 200 New York, N.Y. 10028 415-754-6600	Thomas National, Inc. 1775 Broadway, N.Y.C. 370/158 DATACENTER OS-VS - RJE And Other Communications Automated Photo Composition DOS Emulation 3330's and 2314's Systems and Programming Support Data Entry Services Convenient 57th St. Location Open 24 Hours Per Day Call (212) 765-8500	NEW YORK Thomas National, Inc. 1775 Broadway, N.Y.C. 370/158 DATACENTER OS-VS - RJE And Other Communications Automated Photo Composition DOS Emulation 3330's and 2314's Systems and Programming Support Data Entry Services Convenient 57th St. Location Open 24 Hours Per Day Call (212) 765-8500	

370's Wanted

If you now OWN or LEASE a 370 and "WANT OUT" of your present configuration, Randolph Computer Company will sublease your 370 hardware for you.



For information, call:
Bob Bardage, Vice President
(203) 661-4200

RANDOLPH COMPUTER COMPANY
537 Steamboat Road
Greenwich, CT, 06030

McNELL SECURITIES CORPORATION

Investment Bankers, Underwriters
and Distributors of Securities

22 Thames Street
New York, N.Y. 10006
(212) 267-6400

CAPITAL FOR EMERGING AND
MIDDLE-SIZED COMPANIES
INVOLVED IN THE
COMPUTER INDUSTRY

We feel that now is the time for emerging growth companies in the computer industry to establish long term financial strategy and consider raising capital, in the way we believe will help the company grow faster, more profitably.

We underwrite public offerings between one and five million and also arrange private financing.

To become a client, a company must have a profitable history and good growth potential.

McNELL SECURITIES CORPORATION

Contact Thomas R. Mc Nell

(212) 267-6400

370 155 I OR J

• Available October

• Term 1 to 5 Years

• 0, 1/2, 1 or 2 Megabytes

• IBM DAT on Order

• Rates to 45% MAC

Call Larry Goichman

Alanthus Corporation

(914) 428-3703



Wiltek, Milgo, Penril, Comten

Data Communications Firms' Profits Rise

Four data communications equipment firms—Wiltek, Milgo, Penril and Comten—have reported improved results in recent periods.

Wiltek, Inc.'s earnings for the six months ended April 30 more than doubled over those of a year ago, to \$242,000 or 18 cents a share compared with \$99,000 or 7 cents a share in the 1973 period.

Revenues totaled \$8.1 million compared with \$4.7 million in the same year-period.

Second quarter earnings reached \$100,000, or 8 cents a share, up from \$61,000 or 4 cents a share last year. Revenues in the three months grew to \$4.4 million compared with \$2.7 million in the 1973 quarter.

Interest expenses have climbed almost \$400,000 from the first

six months of 1973 to the same period in 1974, the firm said.

Wiltek plans to level off sales during the next several months in order to minimize the effect of high interest rates and tight credit, President Robert J. Amman said.

This move will provide time for the company's internal cash flow to catch up with its requirements and limit the need for additional external financing, he said.

Quarter Declines

Milgo Electronic Corp.'s six-month results were also improved over those of a year ago. However, second quarter earnings declined slightly from the year-ago figure.

The decrease in sales volume in the second 1974 quarter com-

pared with the first quarter was due to production difficulties, the firm said.

For the six months, Milgo earned \$1.6 million or \$1.03 a share compared with \$1.5 million or 93 cents a share in the year-ago period.

Revenues climbed to \$13.6 million last year.

In the second quarter, Milgo's earnings totaled \$784,000 or 50 cents a share compared with \$787,000 or 49 cents a share. Revenues totaled \$6.6 million compared with \$5.3 million a year ago.

At Comten, Inc., first-quarter revenues rose to \$2.3 million from \$1.5 million with a pretax profit of \$270,000 compared with a loss of \$60,442 or 3 cents a share in the year-ago period.

System rentals and maintenance revenues were about \$439,000 greater than in the same 1973 period, a significant factor in the improved results, observed President Donald J. Herman.

Twenty-three communications computer systems were delivered during the three months, equivalent to about 50% of total deliveries for all of 1973, he said.

Trend Continues

The profitable trend established in the fourth quarter at Penril Corp. continued into the first half-ended Jan. 1.

Earnings rose to \$144,980 or 13 cents a share, including a \$72,690 tax credit, compared with a loss of \$131,191 or 11 cents a share in the year-ago period.

The Electro-Metrics Division, purchased from Fairchild Camera and Instrument Corp. last August, contributed \$78,964 towards earnings.

Revenues rose 282% to \$1.9 million from \$687,106 last year. The firm changed its name from Penril Data Communications, Inc. in order to reflect a wider range of products.

Pertec Posts Loss After Write-Off; Revenues Grow in Nine Months

EL SEGUNDO, Calif.—Write-off of a line printer in the third quarter adversely affected Pertec Corp.'s third-quarter and nine-month earnings compared with those of a year ago.

Revenues during both periods continued to climb.

However, after totally writing off the costs of closing down the printer line, Pertec is looking forward to increased revenues and profits during the fourth quarter, President Ryal R. Poppa said.

In the third quarter ended March 29, revenues grew to \$8.4 million from \$7.5 million, but the firm lost \$285,000 or 9

cents a share in the same year-ago period.

Income from operations during the period declined to \$232,000 compared with \$562,000 a year ago. The loss from the printer operations and their disposal was \$517,000.

Nine-month revenues rose from \$19.4 million in 1973 to \$23.5 million this year. Pertec earned \$376,000 or 12 cents a share compared with \$1.1 million or 35 cents a share last year in the nine months.

Income from operations declined to \$1.2 million from \$1.5 million. In the nine months, the loss from printer operations and their disposal totaled \$1.1 million.

Delays in planned shipments of the firm's shared processor and CRT terminal until contract negotiations were complete also adversely impacted third-quarter earnings, Poppa said. Shipment of these products are now on schedule, he noted.

Optical Scanning Lists

Third-Quarter Gain

NEWTOWN, Pa.—The profitable trend shown in the third quarter at Optical Scanning Corp. is also evident in the nine-month results compared with losses in both 1973 periods.

In the three months ended March 31, the firm earned \$424,098 or 64 cents a share, of which \$373,294 stemmed from special credits. This compares with a loss of \$76,417 or 12 cents a share a year ago.

Revenues in the third quarter grew 32% to \$4.8 million compared with \$3.6 million in 1973.

In the nine months, earnings jumped to \$574,245 or 87 cents a share, of which \$459,894 came from special credits. This compares with a loss of \$226,273 in the 1973 period.

Revenues totaled \$14.2 million compared with \$10.4 million in the same 1973 period.

Memorex Considers

Additional Charges

SANTA CLARA, Calif.—Memorex Corp. is considering additional charges of up to \$4 million in the current quarter, Robert C. Wilson, chairman and president, said at the firm's annual meeting.

"A prudent company tries to be conservative. There's nothing dramatic, just a relook at our condition," Wilson said later, noting the write-off would not involve any particular area.



OMNITEC ANNOUNCES OFF-THE-SHELF DELIVERY

Delivery problems on acoustic couplers? Not for OMNITEC's Model 2018. This coupler, designed for terminal operation at data rates up to 600 baud is available immediately for one piece or large quantities.

Featuring acoustic or hardware mode, half or full duplex operation, TTY or EIA interface as standard items plus delivery NOW.

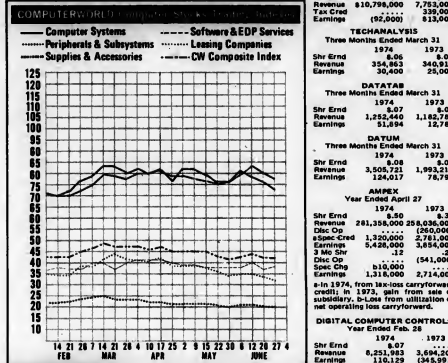
Call us for this originate only coupler and any of our other models.

OMNITEC CORPORATION

2405 S. 20th Street
Phoenix, Arizona 85034
(602) 258-8244

Earnings Reports

GENERAL AUTOMATION			DATA TECHNOLOGY			NATIONAL SYSTEMS		
Three Months Ended April 27			Year Ended April 27			Three Months Ended March 31		
Revenue	\$1,295,837	\$73	Revenue	\$1,300,000	1973	Revenue	\$1,295,837	1973
Shr Earnings	\$8.54	\$2.23	Shr Earnings	\$1,300,000	1973	Shr Earnings	\$8.54	\$2.23
Operating	15,210,000	7,761,000	Operating	17,300,000	12,040,000	Operating	15,210,000	7,761,000
Non-Operating	1,200,000	1,200,000	Non-Operating	1,200,000	1,200,000	Non-Operating	1,200,000	1,200,000
9 Mo Shr	\$1,295,837	\$2.23	9 Mo Shr	\$1,295,837	\$2.23	9 Mo Shr	\$1,295,837	\$2.23
Operating	15,210,000	7,761,000	Operating	15,210,000	7,761,000	Operating	15,210,000	7,761,000
Non-Operating	1,200,000	1,200,000	Non-Operating	1,200,000	1,200,000	Non-Operating	1,200,000	1,200,000
Tax Credit	2,610,000	589,000	Tax Credit	2,610,000	589,000	Tax Credit	2,610,000	589,000
Operating	2,610,000	589,000	Operating	2,610,000	589,000	Operating	2,610,000	589,000
Non-Operating	2,610,000	589,000	Non-Operating	2,610,000	589,000	Non-Operating	2,610,000	589,000
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS			COMPUTER INSTRUMENTS		
Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837	Revenue	\$1,295,837	\$1,295,837
Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837	Shr Earnings	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837
Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837	Non-Operating	\$1,295,837	\$1,295,837
9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837	9 Mo Shr	\$1,295,837	\$1,295,837
Operating	\$1,295,837	\$1,295,837	Operating	\$1,295,837	\$1,295,837	Operating		



Computerworld Stock Trading Summary

[illegible]

COMPUTER MACHINERY/REMCOM

Suddenly there's a new force in

Datamoving

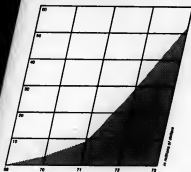
Data isn't born in computers. And it doesn't die there. Data moves. From where people create it...to where people use it. • Data moves from sales orders and stock orders and time cards...to invoices and inventory listings and paychecks. • On the way, it's organized, balanced, validated, edited, enhanced, packaged, and shipped to a computer. • That's datamoving. It goes far beyond the old concept of data entry. • Outbound from computers, data moves to branch offices, warehouses, manufacturing plants — out to where the people are who fill the orders, manage the inventories, and take home the paychecks. • In 1969 Computer Machinery pioneered a new field called shared-processor data entry — using minicomputers to cut the cost of data preparation by 30-50%. By adding data communications hardware and software to these systems, we also gained an initial, rapidly growing position in the remote batch terminal field. • During this same period, Remcom began supplying terminal systems for remote batch processing networks — making it possible for one central computer to serve many outlying locations. • Computer Machinery has become the world leader in its field. Remcom has become the second-largest independent in its field. • On June 7, 1974, through acquisition, the two seasoned pioneers joined forces to create a new force in datamoving. • We move data across town, across continents, or across oceans. We move it via disks, tapes, punched cards, and communications lines. We move it from keying centers to computers to output printers. We move it in large batches or small ones. • Datamoving is the fastest-growing sector of the computer industry. We helped create it. And we're moving with it.

Computer Machinery Corporation

2500 Walnut Avenue, Marina del Rey
Post Office Box 92300
Los Angeles, California 90009

Send for our 1973 Annual Report. Written before we acquired the Remcom business, it describes the natural evolution of our shared-processor product line into the data communications field.

Computer Machinery Corporation Annual Revenues



Shared-Processor Data Entry Systems

Computer Machinery

Inflorex

Mohawk Data Sciences

Entrex

General Computer Systems

Consolidated Computer

Honeywell

GTE Information Systems

4 Phase

Remote Batch Terminal Systems

IBM

Data 100

Remcom

Harris-Intertype

Univac

Control Data

Burroughs

Mohawk Data Sciences

Computer Machinery